TTS 58B SERIES

IMPULSE COUNTER AND NOISE MEASURING SET

COVERS: 58B, 58B-CN

GENERAL ELECTRIC
INSTRUMENTATION & COMMUNICATION
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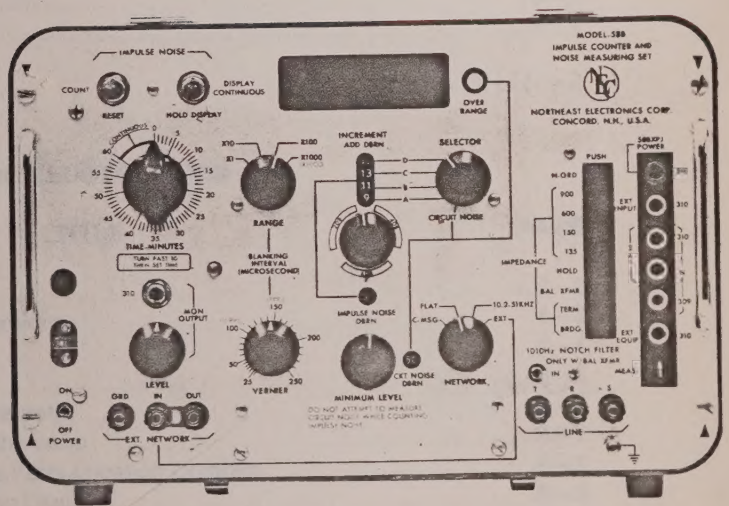

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SECTION 1

GENERAL DESCRIPTION

1.1 GENERAL DESCRIPTION

1.2 The Model 58B is an impulse counter and noise measuring set utilizing digital readout and high speed integrated logic circuits to measure impulse noise distribution from 20 to 107 dBrn at four threshold levels at a count rate adjustable from 4/sec to 40,000/sec. A control provides for selection of threshold level separations of 2, 4, or 6 dB. A built-in timer permits selection of observation periods up to one hour.

1.3 At the same time the set will measure RMS value of steady state noise from 0 to 100 dBrn, weighted, flat, or longitudinal noise-to-ground.

1.4 Three internal weighting networks, C MSG, flat, and 10.2-51 kHz for 40.8 kilobit data systems are provided. Connections for external networks are also available with flat response to 108 kHz.

1.5 Input impedances of 135, 150, 600, and 900 ohms, bridging or terminated, with excellent common mode rejection are provided, plus dial through capability with holding circuit.

1.6 An output monitor, with flat response to 108 kHz provides a means for observing or recording the signal being measured.

1.7 A phase jitter and phase hit measuring accessory, Model 58BXPJ, in a matching cover, is also available on an optional basis.

1.8 The unit operates from 115 or 230 Vac, weighs 27 pounds and measures 14 1/2 in w × 12 in h × 9 3/8 in d. A relay rack-mounted unit designated 58BR is also available.

SECTION 2

SPECIFICATIONS

2.1 The major specifications of the Model 58B Impulse Counter And Noise Measuring Set are listed in Table 2–1.

Table 2–1. Overall Specifications

SENSITIVITY		
Impulse Noise:	20 dBrn to 107 dBrn	
Circuit Noise (Metallic):	0 dBrn to 99.9 dBrn	
ACCURACY (Impulse)		
Impulse Noise:	C Msg ± 1 dB	20 to 107 dBrn
	FLAT ± 1 dB	20 to 107 dBrn
	10.2-51 kHz ± 1 dB	30 to 107 dBrn
	Ext (Wide Band) ± 1 dB	30 to 107 dBrn
COUNTING RATE	Blanking interval adjustable from 0.25 seconds to 25 μs, in four decade ranges coupled with a vernier control.	
Accuracy:	±20% of vernier setting.	
INPUT IMPEDANCE		
Without balance transformer:	±5% <10° 100 Hz - 108 kHz	
With balance transformer:	900 ± 5% < 10° Hz - 25 kHz 600 ± 5% < 10° Hz - 50 kHz 150 ± 5% < 10° Hz - 108 kHz 135 ± 5% < 10° Hz - 108 kHz	
Bridging (at 1 kHz):	25,000Ω without balance transformer 12,000Ω with transformer	
Noise to Ground:	Across Line 41,000Ω To Ground 50,000Ω	
HOLD CIRCUIT		
DC resistance:	700Ω ± 10%	
INPUT DC BLOCKING	Input DC blocked for 150 Vdc with or without input transformer.	
COMMON MODE REJECTION		
With balance transformer:	>80 dB 50 Hz to 10 kHz	
Without balance transformer:	>70 dB 100 Hz to 10 kHz >50 dB 50 Hz to 108 kHz	
MONITOR OUTPUT		
Monitor output impedance:	600Ω nominal. Output level adjustable from approximately 0 dBm to −40 dBm into 600Ωload.	

Table 2—1. (Cont'd)

POWER REQUIREMENTS	115 Vac or 230 Vac, 50/400 Hz, approx. 10 watts
SIZE:	14 1/2 in w × 12 in h × 9 3/8 in d
WEIGHT:	27 lbs.

CIRCUIT NOISE (STEADY STATE):

NETWORK	TEST FREQ.	ACCURACY	
C Msg	1 kHz	±0.5 dB	0 to 99.9 dBrn
Flat	1 kHz	±0.5 dB	10 to 99.9 dBrn
Flat	1 kHz	±1.0 dB	0 dBrn
10.2-51 kHz	25 kHz	±0.5 dB	10 to 99.9 dBrn
10.2-51 kHz	25 kHz	±1.5 dB	0 dBrn
Ext (Wide Band)	25 kHz	±0.5 dB	10 to 99.9 dBrn

NOISE TO GROUND 40 dBrn to 139.9 dBrn Accuracy: ±1.0 dB

SECTION 3

OPERATING INSTRUCTIONS

3.1 This section provides information needed for proper operation of the 58B Impulse Counter and Noise Measuring Set. Figure 3—1 shows the front panel controls and Table 3—1 briefly describes the function of each control.

3.2 **OPERATION**

3.3 Connect an AC cord to the 115V ac line. Turn power switch on.

CAUTION

If unit is to be operated from a 230V ac source, proceed as follows:

1. Remove four captive screws on front panel.

2. Remove unit from case.

3. Locate S12, 115-230V ac selector switch mounted on partition - upper left-hand corner and place switch in 230 position.

4. Replace unit in case and secure captive screws.

5. Connect an AC cord to the 230V ac line. Turn power switch on.

3.4 Connect the external line to be tested to the appropriate line jack or to the line tip-ring-sleeve binding posts. A type 309, type 310, type 241 or a twin banana plug can be used to establish connection to the 58B input circuit.

3.5 If the line connection is to be dialed:

1. Connect a dial or telephone to the EXT EQUIP jack. A 310 type plug must be used.

2. Place MEAS turnbutton switch in vertical position. This transfers all line jacks to the EXT EQUIP jack.

3. Depress corresponding pushbuttons for desired functions. (i.e. 900, TERM, HOLD, BAL XFMR.)

4. Dial the desired number.

5. When line connection has been established, place MEAS turnbutton switch in the horizontal position.

6. The dial may now be removed. The internal hold circuit will maintain the connection.

3.6 Set NETWORK switch to desired weighting characteristics. If an external network is to be used, remove shorting link between IN and OUT binding posts and make appropriate filter connections to these binding posts. External network to be used should be for 600-ohm impedance and have an insertion loss of approximately 0.6 dB. Filters with other insertion losses can be used with the difference added to or subtracted from the sensitivity settings of the Model 58B.

3.7 **Setting Circuit Noise Measurement Sensitivity.** It is strongly advised that circuit noise, metallic and/or noise-to-ground measurements be made separately and not simultaneously with impulse noise tests. Set SELECTOR switch to CIRCUIT NOISE position.

1. If readout display is extinguished and OVER RANGE lamp is on, decrease sensitivity by setting MINIMUM LEVEL control to a high number until lamp goes out. Simultaneously, the readout display will be illuminated.

2. If both the OVER RANGE lamp and readout display are extinguished increase sensitivity by setting MINIMUM LEVEL control to a lower number until readout display becomes illuminated. Allow at least one second interval between steps when adjusting MINIMUM LEVEL control.

3. Read display directly.

4. If noise-to-ground measurement is to be made, push N-GND pushbutton and add 40 dB to reading.

3.8 **Setting Impulse Measurement Sensitivity.** The sensitivity of each of the four impulse channels A, B, C and D, is the sum of the MINIMUM LEVEL control setting and the individual INCREMENT control setting. The INCREMENT control automatically sets the threshold of each channel simultaneously. (See Table 3—2.)

3.9 Set SELECTOR switch to CHANNEL A.

3.10 Set blanking interval by adjusting the VERNIER and RANGE controls to equal the bit period. (i.e. Bit rate = 1800 per second. 1 bit period = approximately 556 μs.) To convert bit rate to 1 bit period:

1 bit period (seconds) =

$$\frac{1}{\text{bit rate}} = \frac{1}{1800} = .000556 \text{ sec.}$$

1. Set VERNIER to approximately 55 on dial.

2. Set RANGE to X10. This is approximately 550μs.

3.11 To set blanking interval for a maximum count rate of 10 pps:

1. Set VERNIER to 100 on dial.

2. Set RANGE to X1000. This is approximately 0.1 second or 100,000μs.

3.12 To set blanking interval for a maximum count rate of 7 pps:

1. Set VERNIER to approximately 143 on dial.

2. Set RANGE to X1000. This is approximately 0.143 seconds or 143,000μs.

3.13 Set timer to desired time in minutes.

3.14 Immediately and momentarily depress the COUNT/RESET key switch to the RESET position. This resets all counters to 0 and establishes the start of the impulse noise test.

CAUTION

From the start and during the course of an impulse noise test, DO NOT readjust or activate any control or controls other than the MON output level control, DISPLAY keyswitch, or SELECTOR switch as this may cause the instrument to accumulate erroneous counts.

The SELECTOR switch may be activated to observe accumulated counts on any channel at any time, but DO NOT advance selector to CIRCUIT NOISE position.

3.15 During an impulse noise test, accumulated counts on any one or all four channels can be observed and recorded at any precise moment by activating the DISPLAY switch to the HOLD position. The DISPLAY switch must be released and reactivated as each channel is observed.

3.16 At the end of test, when mechanical timer has returned to 0, set SELECTOR switch to each channel and record individual readings (refer to paragraph 3.8). Readings indicate that a total of 186 impulse hits exceeded a threshold level of 40 dBrn; 92 of these exceeded a threshold level of 44 dBrn; 43 exceeded a threshold

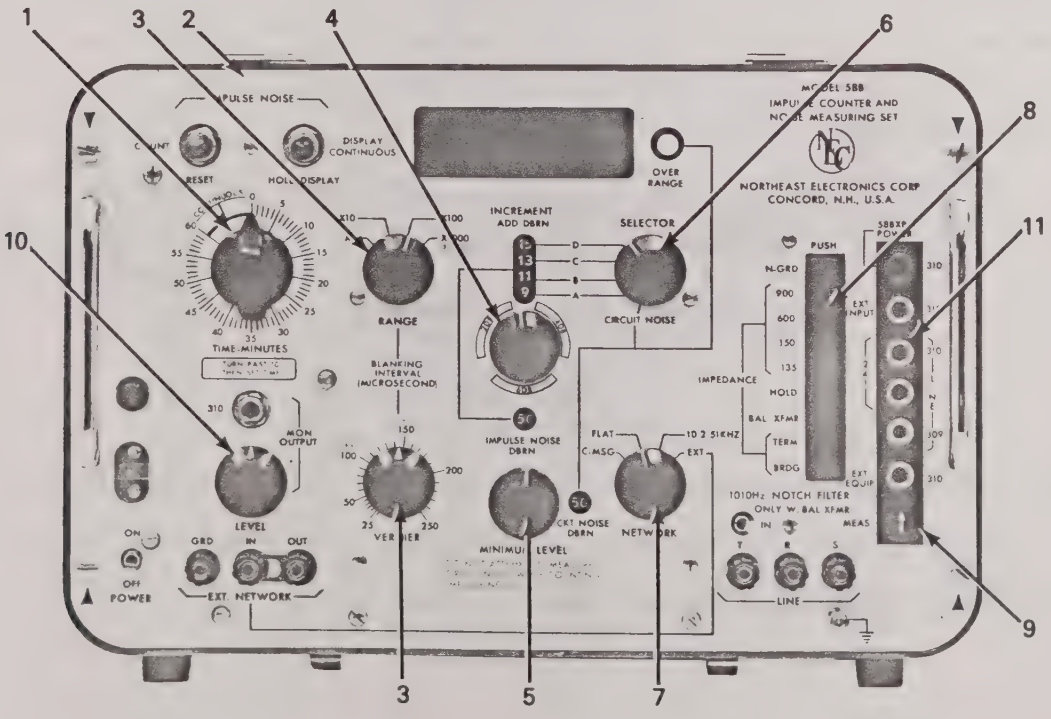

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Figure 3—1. Front Panel Controls

level of 48 dBrn and 21 exceeded a level of 52 dBrn. Refer to Table 3—3.

3.17 To monitor using the Model 58B Inpulse Counter and Measuring Set perform the following steps:

1. Plug headset nto the MON OUTPUT jack. This jack will accept a 310 type plug. Signal is to tip; ring and sleeve are ground.

2. Adjust MON OUTPUT for desired level.

3. Monitor output response is determined by NETWORK switch.

Table 3—1. Front Panel Controls

NAME OF CONTROL	FUNCTION
1. TIME-MINUTES	60 minute timer (A 30 minute timer is optional). Both provided with a continuous operating position.
2. IMPULSE NOISE	RESET-OFF: Resets all impulse counting logic to zero or disables counting logic until released. HOLD or CONTINUOUS DISPLAY: Allows display to follow the impulse count sequence or holds display until released without interrupting the count.
3. BLANKING INTERVAL (Microsecond)	VERNIER: Adjusts desired blanking interval in microseconds. RANGE: Selects desired decade multiplier.
4. INCREMENT ADD DBRN	Attenuator provides for 2, 4, or 6 dB spread between the four threshold levels and scaled by 0, 3, 6 and 9 dB. Results in 12 different threshold combinations.
5. MINIMUM LEVEL	Attenuator, 0 to 90 dBrn in 10 dB steps for circuit noise measurements. Attenuator, 20 to 80 dBrn in 10 dB steps for impulse noise measurements.
6. SELECTOR	Selects levels of A, B, C, D or circuit noise measuring circuits.
7. NETWORK	Selects C-MSG, FLAT, 10.2-51 kHz or external network.
8. INPUT (Pushbutton switch)	Provides for selecting the following: Impedance 135, 150, 600, or 900 ohms Bridging or terminate (BRDG. or TERM) Noise-to-ground (N-GND) Hold circuit (HOLD) Balance transformer (BAL. XFMR)
9. MEAS (Turnbutton switch)	Provides for connecting line circuit to external equipment (Dial, etc.)
10. LEVEL (Mon output)	Provides for adjusting monitor output to desired level.
11. Jackfield	Jacks are provided for type 241, 309, and 310 plugs for Line, External Equipment and accessories.

Table 3—2.

Minimum Level (Imp. Noise dBrn)	Increment (Threshold Setting)	Channel	Channel Sensitivity
40	12	D	52 dBrn
40	8	C	48 dBrn
40	4	B	44 dBrn
40	0	A	40 dBrn

Table 3—3.

Mimimum Level (Impulse Noise dBrn)	Increment (Threshold Setting)	Channel	Channel Sens.	Readings (Impulse Hits)
40	12	D	52 dBrn	21
40	8	C	48 dBrn	43
40	4	B	44 dBrn	92
40	0	A	40 dBrn	186

SECTION 4

CIRCUIT DESCRIPTION

4.1 INPUT CIRCUIT, LINE SELECTION (See Figure 7–2).

1. The balanced input circuit provides a choice of connectors for establishing connection to a line. Turn-button switch S1 connects all line jacks to the EXT EQUIP jack for dialing purposes.

2. The hold circuit, made up of resistors R101, R102 and inductor L1, is placed across the line by activating switch S17.

3. Resistors R106 through R109 and R111 through R114 are used as terminating resistors. The selectable termination is made up of a pair of resistors appearing across the input line terminals via the BRDG/TERM switch S19 and S20. Capacitor C2, is series with the terminating resistors, provide dc blocking up to 150V.

4. Resistors R103, R104, R105, and R110 constitute a 40 dB balanced attenuator for longitudinal noise measurements.

5. Activating switch S18 places the input balance transformer T2 across the line for maximum longitudinal rejection to low frequencies. The transformer is connected for a 1-1 transfer of the input signal with minimal loss.

6. Resistors R29 and R30 are used to equalize the terminated impedance appearing across the line when the input balance transformer T2 is in the out position. With T2 out of the circuit, capacitors C102 and C103 provide dc blocking up to 150V.

4.2 INPUT BALANCED AMPLIFIER (see Figure 7–2)

1. The amplifier presents a balanced input to the line when the transformer T2 is not in the circuit, and has an input impedance of 24.9 kohm, the resistance of R115 and R116.

2. Integrated circuit IC101 and the emitter follower transistor Q102 constitute the voltage amplifier. The gain is set at 20 dB when the MINIMUM LEVEL control is in the 0 to 40 dBrn positions, and a loss of 10 dB when in the 50 to 90 dBrn positions. As a 20 dB amplifier, the gain is controlled by resistors R115 and R117. When relay RY102 is energized, resistors R118 is placed in shunt with R117 thus increasing the negative feedback by 30 dB with a net gain of −10 dB.

3. Input balance is maintained by keeping the ratio of the voltage divider, R116 and the branch R119 through R124, equal to the ratio of the voltage divider, R115 and R117, R118. The relay RY101 is operated when relay RY102 is energized. Variable capacitors C104, C105, C106, and potentiometers R121 and R122 provide the means for optimizing the input balance.

4. Resistors R129 through R135 form voltage dividers for impedance level equalization. Relays RY103, RY104, and RY105 are individually activated when the corresponding input impedance is selected.

4.3 WEIGHTING NETWORKS (see Figure 7–3)

1. The C-MSG weighting characteristics are determined by the passive elements of the filter. Transistors Q201 and Q202 constitute a voltage amplifier with approximately 14 dB of gain which compensates for the insertion loss of the passive filter. The variable resistor R210 is used for adjusting the overall gain of the C-MSG network.

2. The 10.2 to 51 KHz bandpass filter network is a cascaded high pass, low pass filter with approximately 18 dB/octave slopes.

3. In the Flat weighting network, capacitor C217 limits the high frequency response with a 6 dB/octave roll-off. Resistors R215, R216 introduce an adjustable amount of loss, (typically 0.6 dB) for level equalization.

4. The impedance for the networks is 600 ohms for both source and load. The 600 ohm source impedance is provided by the voltage dividers for impedance equalization. The 600 ohm "L" pad attenuator (switch S3, deck 7) provides the load impedance. This "L" pad attenuator controls a total of 30 dB of attenuation in 10 dB steps common to all modes of operation.

4.4 BUFFER AMPLIFIER (see Figure 7–3)

1. The integrated circuit IC201 and the emitter follower Q203 constitute a voltage amplifier with an adjusted gain of approximately 26 dB. The gain adjustment control, R219 has a range of approximately ±2 dB.

2. Diodes CR201 through CR206 are used as limiters and thus limit the output voltage swing to approximately 2 volts, peak to peak.

3. The output of the amplifier is connected to two 1000 ohm "L" pad attenuators. One attenuator (switch S5, deck 5) controls a total of 9 dB attenuation in 3 dB steps common to all four impulse channels. The second attenuator, (switch S3, deck 2) controls 30 dB of attenuation in 10-dB steps common only to the circuit noise channel.

4.5 AMPLIFIER, CIRCUIT NOISE (see Figure 7—4)

1. The integrated circuit, IC901, is a voltage amplifier with a gain of approximately 47 dB. A range of approximately ±2 dB is provided by the gain adjustment control R905. The output is connected to the monitor output level control R2 through R935.

2. The single stage transistor amplifier Q901 is designed to deliver a maximum of 0 dBm into a 600-ohm load. The output impedance is approximately 600 ohms.

4.6 AC To DC CONVERTERS (see Figure 7—4)

1. The output of the integrated circuit amplifier IC901 is connected to the Ac to DC converter via coupling capacitor C905, resistor R906 and capacitor C908.

2. Transistors Q902 and Q903 form a cascade amplifier. Transistor Q902 is connected in a common emitter configuration and Q903 in a common base configuration.

3. The collector of Q903 drives two types of detector circuits. The first, an average detector made up of diodes CR901, CR902, resistors R919 through R922 and capacitors C914 and C915. Negative feedback is taken from this average detector.

4. The second detector is a combination average and peak detector which results in an rms value of the signal being detected. Transistor Q904 is an emitter follower and supplies the power necessary to drive the low impedance detector diode/resistors combinations, CR903, R917 and CR904, R923.

5. The rms detector outputs are connected to a balanced dc amplifier, IC902. The dc gain of this amplifier is determined by R925 and the series-parallel combination R928, R929 and R930. The gain control, R929, is used as a means for adjusting the dc threshold voltage.

6. The resistor-capacitor combination, R932 and C922, is used to reduce the ripple at the lower frequencies.

4.7 DC To LOG CONVERTER (see Figure 7—5)

1. The integrated circuit IC706 and associated circuitry function as the dc to log converter. When switch Q704 is open and switch Q705 is closed, capacitor C706 charges linearly through closed switch, Q706, to a given positive voltage determined by the level of the negative voltage at the input (TP11.12).

2. The slope at which capacitor C706 charges for a given dc voltage is a function of the value of the charging capacitor C706 and the resistor R717.

3. The DC voltage limits from the output of the AC to DC converter, corresponding to an operating dynamic range of 12 dB, is approximately −1.5 Vdc to −6.0 Vdc.

4. A reference voltage of +1.5 Vdc sets the threshold at which the capacitor, C706, will charge to a positive voltage. This reference voltage is derived from the voltage divider R705, R706 and R707.

5. When the input negative voltage is below the dynamic range, less than −1.5 Vdc, the capacitor C706 is effectively disconnected from the charging circuit and remains uncharged. This condition occurs whenever the summing junction, pin 4 of IC706, is positive respect to ground, and causes the output of IC706 to saturate at −12 Vdc. The output of IC706 is connected to the inverting input, pin 4 of IC707 and results in its output to saturate at approximately +12 Vdc. This turns off the switch Q706 and effectively opens the charging path.

6. In the reverse condition, when switch Q704 is closed and switch Q705 is open, the capacitor C706 has an accumulated positive charge.

7. The negative voltage from the AC to DC converter is effectively disconnected from the summing point of IC706, and a discharge path connected around capacitor C706. This discharge path consists of resistors R714, R715, and transistor Q704.

8. The capacitor, C706, discharges at a logarithmic rate with the discharge time being a function of resistors R714 and R715. Variable resistor R15 provides the means for calibrating the upper end of the 12 dB dynamic operating range.

9. Resistors R712 and R713 in the base circuit of Q704 regulate the base current being injected into the discharge circuit. The effect of this base current on the discharge time is non-linear and has the least effect when the capacitor is charged to a maximum value. This provides an adjustment for calibrating the lower half of the 12-dB dynamic operating range.

4.8 CONVERTER CONTROL LOGIC. The control logic for the dc to log converter is derived from a 440 Hz clock frequency provided by the astable multivibrator, Q701 and Q702. During the charging cycle of the capacitor C706, the multivibrator frequency is counted by IC701, IC702, and IC705, providing the necessary digital division.

4.9 At a count of 200, the Q output, pin 9 of IC705 provides a high to low transition to the clock input, pin 1 of the second flip-flop and causes Q, pin 13 to go from high to low. This in turn reverses the switch condition and initiates the discharge cycle.

4.10 During the discharge cycle, the multvibrator frequency signal continues to be counted and stored by the two decade counters, IC701 and IC702. The accumulated count is a direct function of the discharge cycle period and in turn is a function of the initial charged potential of the capacitor C706. When capacitor C706 discharges to zero, pin 10 of IC706 goes slightly negative causing pin 10 of IC707 to switch from −12 to +12 Vdc. This transition is differentiated by the RC combination R731 and C715 and the resulting differentiated pulse used to trigger the Transfer and Reset Pulse Generator, IC703 (see Figure 4−1).

4.11 The binary count which has accumulated in the two decade counters, IC701 and IC702 during the discharge cycle is the information which appears at the input of the latches, IC537 and IC538 via the gate matrix, IC533 and IC534. The transfer pulse generated, clock the four quad bi-stable latches and transfers the information to the output of the latches. This information is then committed to memory until new information is transferred. The transfer pulse appears at pin 2 of IC703 and is connected to pins 4 and 13 of IC537 through IC540.

4.12 Immediately following the transfer pulse, a reset pulse is generated which resets the two decade counters IC701 and IC702 to a binary count of zero. This reset pulse appears at pin 14 of IC703 and is connected to pins 2 and 3 of the decade outputers. Simultaneously, a second reset pulse is generated which is used to clear the two flip-flops, IC705. This causes Q pin 13 of the second flip-flop to go from low to high. This again reverses the switch condition of Q704 and Q705 and establishes the start of a new charge cycle. This second reset pulse appears at pin 13 of IC703 and is connected to pin 12 of IC704 and pins 2 and 6 of IC705. The transistor Q703 is used to provide a +12V logic level and necessary inversion to properly operate transistors Q704 and Q705.

4.13 The decade counters IC701 and IC702 provide the binary information for the tenths digit and the units digit respectively. The binary information for the tens digit is derived from a combination of a two bit full adder manually programmed by the MINIMUM LEVEL CONTROL S3 (decks 3, 4, 5 and 6) and follows the truth table described in Figure 4−2. The binary information for the tens digit appears at the input of the latch IC539 via gate matrix IC536. (See Figure 4−5.) Only these three digits are used when reading circuit noise. The fourth digit is extinguished. A decimal point is controlled by the SELECTOR switch S4 (deck 3A) and appears between the tenths digit and the units digit when in the CIRCUIT NOISE position.

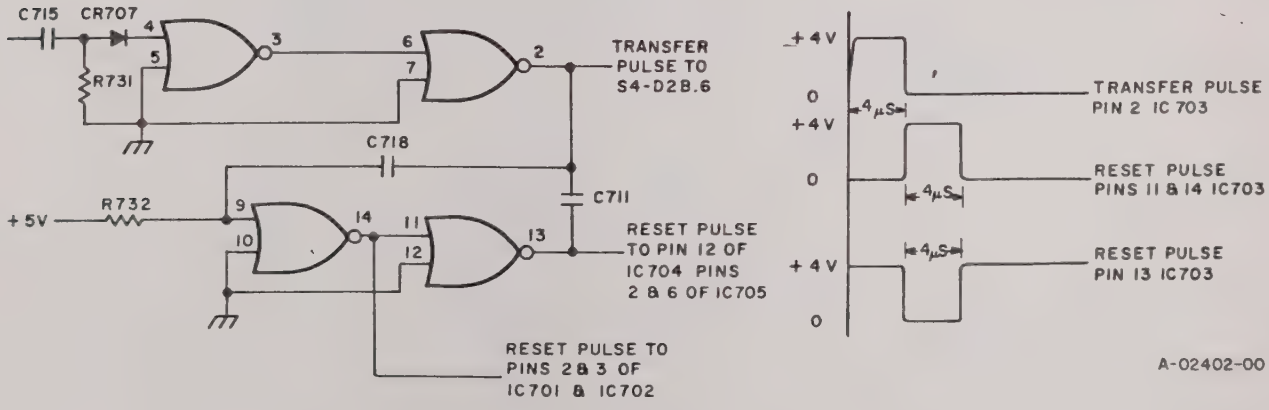


Figure 4−1. Transfer And Reset Pulse Generator

	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	X	TENS DIGIT READOUT
C IN	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	SPILLOVER PULSE FROM PIN 9 IC705
A	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	TENS DIGIT BINARY INFORMATION TO GATE MATRIX
B	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	
C	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	
C2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	PIN 10 IC535
Σ2															1	0					PIN 12 IC535

C IN = SPILLOVER PULSE AT A COUNT OF 300 UPDATES
TENS DIGIT TO NEXT HIGHER NUMBER

BINARY INFORMATION A AND B DERIVED FROM TWO BIT FULL ADDER IC535
BINARY INFORMATION C AND D DERIVED FROM S-3 DECK 5 AND 6

MINIMUM LEVEL CONTROL SETTING										
dBRN	0	10	20	30	40	50	60	70	80	90
S 3	LOGIC LEVELS									
DECK 3	0	1	0	1	0	1	0	1	0	1
DECK 4	0	0	1	1	0	0	1	1	0	0
				C_2				Σ_2		
DECK 5	0	0	0	0 / 1	1	1	1	1 / 0	0	0
								C_2		
DECK 6	0	0	0	0	0	0	0	0 / 1	1	1

0 = GROUND
1 = +5VDC

C_2, Σ_2 } WHERE INDICATED, LOGIC LEVELS DERIVED FROM IC535

A-02403-00

Figure 4—2. Truth Table

4.14 OVER RANGE AND READOUT CONTROL LOGIC

4.15 An overrange condition is said to exist whenever the negative input dc voltage at the drain of Q705 exceeds the −6 Vdc level which corresponds to the upper limit of the 12 dB dynamic range. At exactly 12 dB above threshold, the logic extinguishes the displays and illuminates the overrange lamp DS2. An overrange condition causes the capacitor C706 to charge to a higher voltage, resulting in a discharge period equal to or greater than an accumulation of 320 counts in decade counters IC701 and IC702.

NOTE

The first 200 counts during the charge cycle of capacitor C706 is ignored and does not appear in the final reading. The accumulation of 320 counts corresponds to 12.0 dB. Normally, the reset pulse from the Transfer Reset Pulse Generator IC703 connected to the clock input, pin 12 of IC704, continues to clock the fixed logic levels at the J & K input and keeps the Q output, pin 8, at a logical zero. When an overrange condition exists, the reset pulse connected to the clock input pin 12 of IC704 is overriden by a pulse connected to the PRESET, pin 13 and allows the Q output, pin 8, to go to a logical 1 level which turns on transistors Q707 and Q711. (See Table 4−1.)

4.16 The reset pulse W3 assures that the Q outputs of the dual flip-flop IC705 are at logical zeros at the start of each charge cycle of capacitor C706 (refer to Figure 4−3). The spillover pulses W2, from pin 11 of IC702 occur at each 100 counts. The first spillover count which occurs during the charge cycle causes the Q output pin 9 of IC705 to go to a logical 1. The second spillover count which occurs at an accumulated count of 200 causes the Q output pin 9 of IC 705 to go from a high to a low. (See W4.) This high-to-low transition causes the Q output pin 12 of IC705 to go to a logical 1 (see W5).

4.17 If the discharge cycle period corresponds to an accumulated count of 300 or more, a third spillover count occurs and causes the Q output pin 9 of IC705 to go to a logical 1. (See W4.) This results in both Q outputs of IC705 to be at a logical one level and this condition is recognized by applying this information to a three input NAND gate IC305. (See Figure 4−4.)

4.18 An accumulation of 320 counts or greater is recognized by OR-ing the B and C outputs of the tens digit latch, resulting in a logical one level at the junction of R517, CR501, and CR502. This information is applied to the third input of IC305. (See Figure 4−5.) With logical one levels present at the inputs of the NAND gate IC305, the output of IC305, pin 8 goes from high to low and a preset pulse is generated. (See W7.) This preset pulse overrides the reset pulse present at the clock input, pin 12 and sets the Q output of IC704 pin 8, to a logical 1. (See W8.) The preset pulse continues to override the reset pulse and keeps the Q output of IC704 pin 8 at a logical 1, holding Q707 and Q711 in an "ON" condition.

4.19 One other overrange condition exists in addition to the one described in paragraph 4.17 when the MINIMUM LEVEL CONTROL S3 is in the 90 dBrn position. In this position, the operating dynamic range is restricted to 10 dB. At exactly 100 dBrn, the displays are extinguished and the overrange lamp DS2 is illuminated (see Figure 4−5).

4.20 The tens digit is manually programmed by the MINIMUM LEVEL CONTROL S3 (decks 3, 4, 5 and 6). A binary count of 9 is programmed when S3 is in the 90 dBrn position, and this binary information appears at the output of the latch, IC539 via gate matrix IC536. When the capacitor C706 discharge cycle period corresponds to an accumulated count of 300 or more, a logical one level is made to appear at the Q output, pin 9 of IC705. (See Figure 4−3 W4 shaded area). This pulse is applied to pin 5, C in, of the 2-bit Full Adder, IC535, and updates the binary count appearing at the output of the latch IC539 to 10. This new binary information is applied to the 3 input NAND gate IC305 and the output pin 6 is caused to go from high to low turning off transistor Q701. (See Table 4−1.)

4.21 All overrange information appear on either the 300 count overrange control line or the 320 count overrange control line. Another condition exists where both the displays and the overrange lamp DS2 are extinguished. This occurs when the input signal is below the threshold setting of the MINIMUM LEVEL CONTROL S3.

4.22 When this condition exists, the output of IC707 pin 10, saturates at +12 Vdc and turns on transistor Q707. Table 4−1below describes the state of the logic transistors for the indicated displays and OVERRANGE lamp conditions corresponding to the various operating conditions.

4.23 When the SELECTOR control switch S4 is in any of the IMPULSE channel positions, a ground is connected to the base of transistors Q703 and Q707 through diodes CR1 and CR2. The ground connected to the base of transistor causes the transistor switch, Q704, to remain closed and continues to hold a discharge condition on capacitor C706. The ground connected to the base of transistor Q707 guarantees that the readout tubes will remain illuminated when in the IMPULSE NOISE mode.

Table 4—1. CONDITIONS

DISPLAY OVERRANGE LAMP	ILLUMINATED EXTINGUISHED	EXTINGUISHED EXTINGUISHED	EXTINGUISHED ILLUMINATED	
TRANSISTORS	OPERATION WITHIN DYNAMIC RANGE	OPERATION BELOW DYNAMIC RANGE	OVERRANGE 300 COUNT	320 COUNT
Q707	OFF	ON	OFF	ON
Q708	ON	OFF	OFF	OFF
Q709	OFF	OFF	ON	OFF
Q710	ON	ON	OFF	ON
Q711	OFF	OFF	ON	ON
Q712	OFF	ON	OFF	OFF

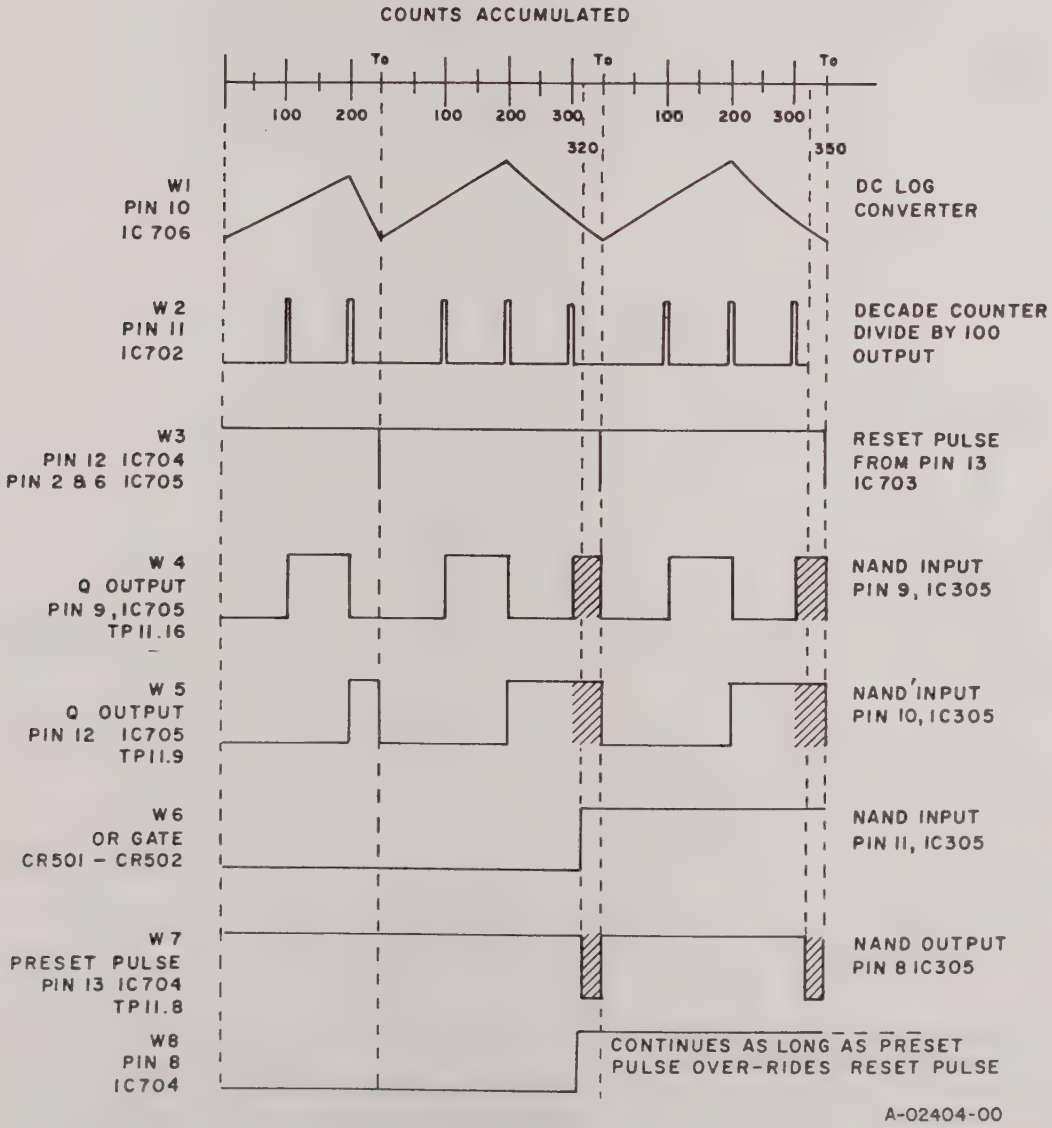


Figure 4—3. DC To LOG Converter Logic

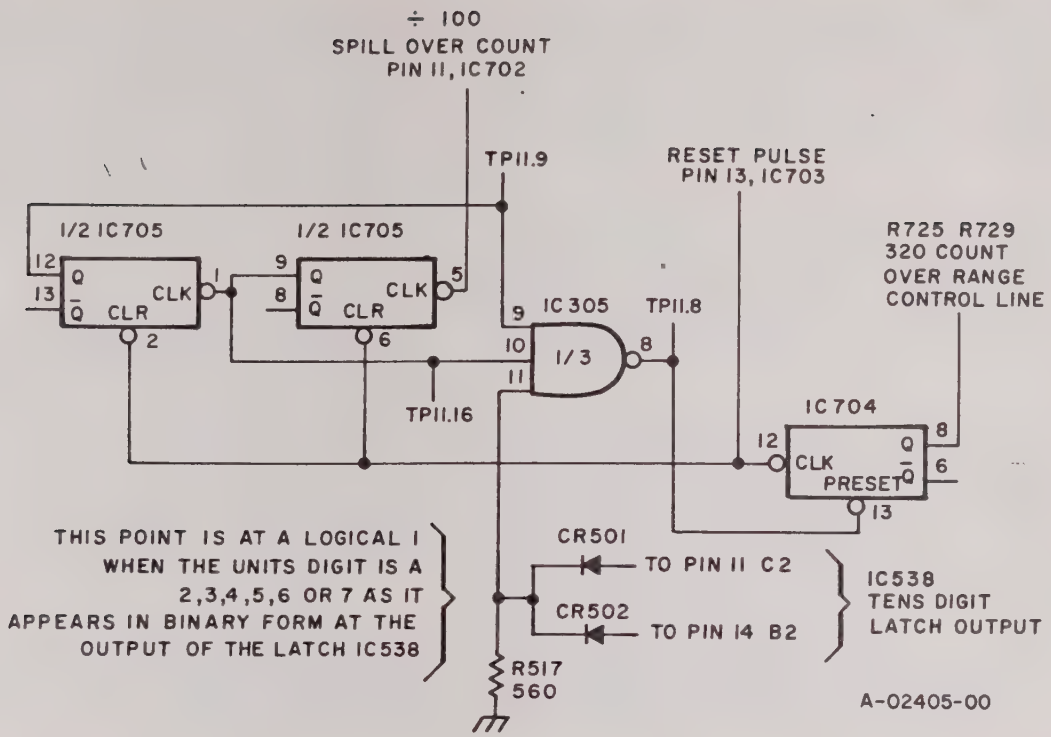


Figure 4—4. 12 dB Over Range Logic Schematic

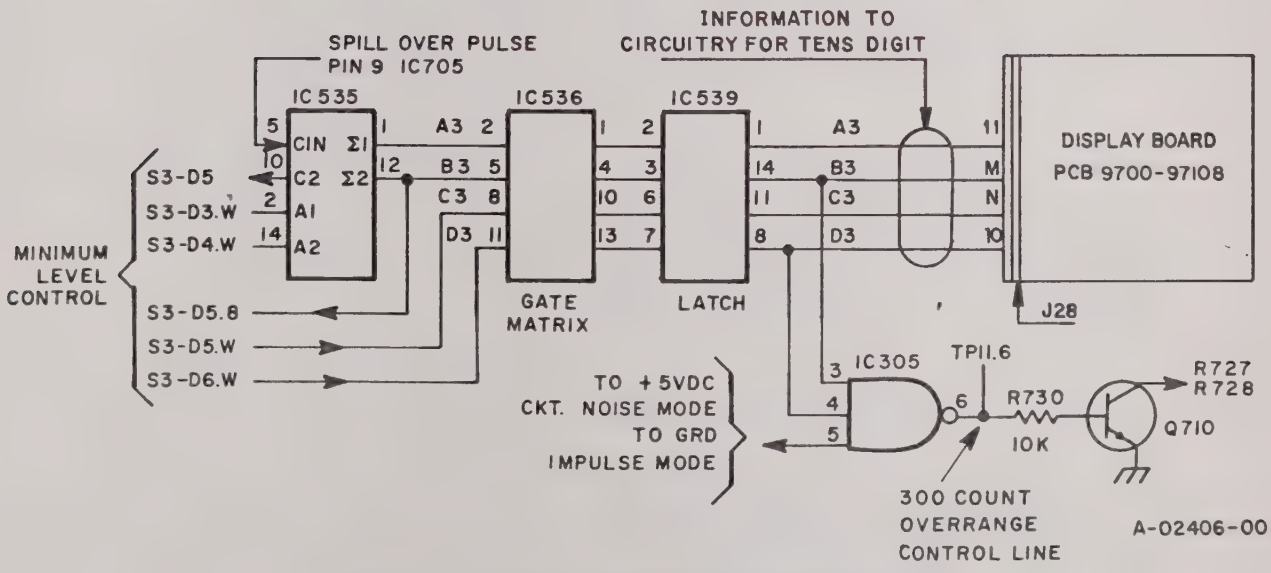


Figure 4—5. 100 dB Over Range Logic Schematic

4.24 IMPULSE PEAK DETECTORS (See Figure 7—6)

4.25 In each impulse peak detector configuration there is an input amplifier driving a dc biased diode bridge which holds a dc amplifier in an off condition. The input signal being measured in channel A, is ac coupled by capacitor C301 from the INCREMENT control S5 (wiper of deck 5) to the non-inverting input, pin 5 of amplifier IC301.

4.26 Variable resistor R302, in series with resistors R301 and R303, form a voltage divider and provide a means for balancing the amplifier sensitivity to both signal polarities. The amplifier sensitivity is adjusted for approximately −40 dB and is determined by the combination of the voltage divider R309 and resistor R315 in series with R316, and the ratio of resistors R306 and R304. Variable resistor R316 is used to adjust the channel A sensitivity.

4.27 The resistor voltage divider R307 and R309 biases the integrated circuit amplifier IC302 in an OFF condition such that the output of the amplifier pin 10 is at approximately −12 Vdc. When the input peak signal is of sufficient amplitude, this bias condition is overcome and reverses the voltage between pin 4 and 5 of the amplifier IC302 causing the output pin 10 to switch from −12 Vdc to +12 Vdc. The width of the pulse generated at the output of IC302 is a function of the magnitude of the peak voltage of the signal being measured.

4.28 Resistors R313 and R314 form a voltage divider to limit the peak positive voltage appearing at the input of IC305, pin 1 to approximately 4 volts. The diode CR303 clamps the negative voltage at approximately −0.6 Vdc.

4.29 The operation of channels B, C and D is the same as that described for channel A in the previous paragraph except that the sensitivity of the input amplifiers varies with the setting of INCREMENT control switch S5. This sensitivity is varied by changing the ratio of the resistor values in the amplifier negative feedback loop. The INCREMENT switch, deck 4, controls the gain of channel B, deck 2 controls the gain of channel C, and deck 1 controls the gain of channel D. Deck 5 is a 3-dB step attenuator with a total attenuation of 9 dB common to all four impulse channels.

4.30 BLANKING INTERVAL AND GATING LOGIC (See Figure 7−6)

4.31 Integrated circuit IC308 and transistors Q305 and Q306 constitute the inhibit circuit and controls the blanking period immediately following an impulse "hit".

4.32 The inhibit circuit is common to all four channels but is activated by channel A only and occurs when the junction of resistors R313 and R314 goes from low to high. This positive voltage is connected to pin 4 of the IC308 through R318 and causes pin 2 of IC308 to go from low to high, thus placing a positive charge on the timing capacitor connected to pin 2. This marks the beginning of one blanking interval. The capacitor discharges through the resistor series combination, R1, R319 and R320 connected to the base of transistor Q306. The base current holds transistor Q306 saturated and effectively keeps the input, pin 4 of IC308 at near ground potential during the discharge period. In addition, the capacitor is connected to pin 5 of IC308 and holds the circuit in the ON condition until the capacitor has discharged sufficiently to release it. This marks the end of one blanking interval.

4.33 If the period of the impulse "hit" exceeds the period of the blanking interval, the inhibit circuit will recycle. The BLANKING INTERVAL RANGE switch S-7 selects the timing capacitor and the BLANKING INTERVAL VERNIER potentiometer, R1 varies the discharge time.

4.34 Normally, pins 2 and 13 of the NAND gate IC305 are both at a logical 1. Pin 1 is connected to the junction of resistors R313 and R314 and is at ground potential until an impulse "hit" causes this point to go to a logical 1. The output pin 12 of IC305 goes from high to low and clocks the input, pin 1 of flip-flop IC307. The Q pin 5 of IC307 goes from high to low applying a ground to pin 13 of IC305 effectively "closing" the gate. The flip-flop continues to hold the gate closed until it is "cleared" by a pulse originating from the blanking interval inhibit circuit. Channels B, C and D operate in the same manner.

4.35 At the end of the blanking interval period, the negative high-to-low transition from pin 2 of IC308 is differentiated by two separate circuits. The differentiated pulse applied to transistor Q301 causes a "clear" pulse to be generated and appears at the collector of transistor Q302. The collector of Q302 is connected to the four flip-flops, pins 3 and 13 of IC306 and IC307 and the "clear" pulse resets the Q outputs pins 5 and 10 to a logical 1.

4.36 The second differentiated pulse applied to the base of Q303 causes a second pulse to be generated and appears at the collector of Q304. This collector of Q304 is connected to the four gates, pin 2 of IC305 and pins 2, 5 and 10 of IC304. This pulse holds the gates closed during that period when the flip-flop is reset by the "clear" pulse.

4.37 CHANNEL COUNTERS-GATE MATRIX & READOUT SECTION (See Figure 7−8)

4.38 The high-to-low transitions appearing at the Q outputs of the dual flip flops IC306 and IC307 are applied to the inputs pin 11, of each respective decade counter, and the binary information for each channel is applied to the gate matrix.

4.39 Decade counters IC501 through IC504 and gates IC505 through IC508 are associated with channel A. Decade counters IC509 through IC512 and gates IC513 through IC516 are associated with channel B. IC517 through IC520 and IC521 through IC524 are associated

with channel C, and decade counters IC525 through IC528 and gates IC529 through IC532 are associated with channel D.

4.40 All binary information accumulated is retained until manually reset to zero by the RESET control S11. The SELECTOR switch S4 places a ground on all the gates in the gate matrix except those gates associated with the channel selected and allows only that binary information to appear at the input of latches IC537 through IC540.

4.41 When in the IMPULSE mode, the transfer latches are held at a logical 1 via switches S4 (deck 2A, deck 2B) and switch S10 when in the DISPLAY CONTINUOUS POSITION. When S10 is in the HOLD DISPLAY position, the transfer line is grounded.

4.42 The binary information present at the output of the latches is applied to the BCD-to-seven segment decoder/drivers U5 through U8. The outputs of the decoder/drivers is strobed by a 2 line to 4 line decoder/multiplexer U4, via pins 4 of U5 through U8. This seven segment information is then displayed by the 7 segment displays U11 through U14.

4.43 TIME AND RESET LOGIC (See Figure 7—9)

4.44 When in IMPULSE mode, the reset pulse to the decade counters associated with the four impulse channels is generated by a one-shot multivibrator. Two NOR gates in IC1001 are used for the multivibrator. A single pulse is generated when +5 volts is applied to C1003 via S11 when activated. This pulse is applied to the base of the buffer transistor stage Q1001 via resistor R1006. With the RESET switch in the OFF position, a continuous ground is applied to the base of transistor Q1001. This turns off transistor Q1001 and allows the collector to be at +5 volts. The collector is connected to pins 2 and 3 of all the decade counters associated with the impulse channels and holds them in a reset condition until S11 is released.

4.45 The other two gates in IC1001 are used as a switching circuit providing logic inversion and transient suppression. The output pin 2 is at a positive voltage when the timer is in the off position. This positive voltage at pin 2 is connected to the base of Q304 and holds this transistor on. The collector is then near ground potential and holds the channel gates IC304 and IC305 closed until the timer is set. When the timer contacts are closed, the output, pin 2, goes to ground and allows the collector of the transistor Q304 to go to a logical 1 allowing the gates IC304 and IC305 to transfer information. At the end of a timing period determined by the timer, the gates are again closed.

4.46 POWER SUPPLY (See Figure 7—10)

4.47 The power transformer, T1, will operate from 115 Vac or 230Vac, 50 Hz-400 Hz. The switch S2 selects the desired operating voltage. The +190 Vdc is derived from a full wave bridge rectifier circuit, CR608, and the RC pi-filter network, resistor R605 and capacitor C607 and C608. The bridge rectifier package CR607 provides both unregulated voltages for the +12V bus and the −12V bus.

4.48 The +12 Vdc is derived from a voltage regulator circuit utilizing a temperature compensated zener diode CR606, as a voltage reference. The integrated circuit IC602 is a dc amplifier and drives the series pass transistor Q605. The negative feedback is taken from the voltage divider network, resistors R613, R614 and R615. The potentiometer, R614 is used as an adjustment for setting the dc voltage to +12 volts. Resistor R601 and capacitor C602 and C603 provide the filtering for the unregulated positive voltage.

4.49 The −12 Vdc is derived from a similar regulator circuit using the +12 Vdc as a voltage reference. The integrated circuit IC601 is a dc amplifier driving the series pass transistor Q606. The negative feedback is taken from the voltage divider resistors R610, R611 and R612. The potentiometer R611 is used as a means for adjusting the dc voltage to −12 volts. The voltage at pin 4 of IC601 is zero volts to ground only when the dc voltage at the opposite ends of the voltage divider, R610, R611 and R612 are equal and opposite.

4.50 The unregulated voltage for the +5V bus is derived from a full wave rectifier circuit, RC601 and CR602. Filtering is provided by capacitor C1. The series pass transistor Q and transistor Q602 form a Darlington circuit. Negative feedback is taken from the voltage divider resistors R606, R607, R608, and diodes CR603 and CR604. This divider is referenced to the −12 volt bus and potentiometer R606 is used to adjust the dc voltage to +5 volts. The transistor Q601 in the negative feedback path regulates the dc voltage on the base of Q602.

4.51 Transistor Q603 and SCR Q604 provide overvoltage protection.

SECTION 5

MAINTENANCE AND CALIBRATION

5.1 MAINTENANCE. The schematics, block diagrams and printed circuit board diagrams identify circuit components. Waveforms and voltages appear on the schematic diagrams. Signal flow diagrams associated with the circuit noise mode circuits appear in Section 4. Components are identified by letter symbols according to the following convention:

C	capacitor
CR	diode
E	printed circuit board
IC	integrated circuit
J	jack or connector
L	Inductor
Q	Transistor
R	resistor
RY	solenoid - relays
S	switch
T	transformer

5.2 MALFUNCTIONS. In the event of a malfunction, ensure that:

1. The power cord is properly connected to available commercial power;

2. All external line plugs are properly wired and inserted in the correct jacks;

3. All switches and controls are set in accordance with the OPERATION section of this manual;

4. The testing being performed in within the specification limits of the instrument.

5.3 When it has been determined that a malfunction does exist, some attempt at interpreting the symptoms should be made prior to removing the set from the case. (See Table 5—1.)

5.4 To remove the set from the case, proceed as follows:

1. Switch off power to the set and remove power cord.

2. Loosen four captive screws marked with arrow heads on front panel.

3. Carefully withdraw set from the case.

4. Reconnect power cord and switch on power when needed.

WARNING

Power line voltages of 115 Vac and/or 230 Vac in addition to +190 Vdc are present in this set and appear in various sections of the unit.

5.5 CALIBRATION. The Model 58B has been calibrated at the factory before shipment. Recalibration should only be performed if component parts are replaced because of a malfunction. Only the circuit directly involved with the component replacement need be recalibrated.

5.6 CIRCUIT NOISE CHANNEL CALIBRATION CHECK

1. Set-up Model 58B front panel controls as follows:

PUSHBUTTONS	600 ohms TERM
	BAL-XFMR
NETWORK	C-MSG
SELECTOR	CIRCUIT NOISE
MINIMUM LEVEL	70 dBrn
POWER	ON

2. Connect a 1-kHz signal with a level of −10 dBm from a 600-ohm source to the line input of the Model 58B. The Model 58B should display 80 dBrn ±0.3 dB.

Table 5—1. Test Equipment Required

EQUIPMENT	USE
NEC Model 2000, Triplett Model 680 NA or equivalent	To measure dc volts
NEC Model 2000, Triplett Model 630 NA, Hewlett-Packard Model 400 series or equivalent	To measure ac volts (high level)
NEC Model 2000, TTS 4C or Hewlett-Packard 400 series	To measure relative dB and/or low level ac volts
Tektronix Oscilloscope Models 535, 541A or 561B or equivalent	To observe waveforms
NEC TTS 4C or TTS 43A or equivalent	Calibrated Signal Source

Table 5—2. List Of Symptoms With Probable Causes

SYMPTOM	PROBABLE LOCATION AND CAUSE OF MALFUNCTION
Set is inoperative (All modes of operation)	Power supply section. Check S2, 115/230 Vac switch for proper setting. Check fuse F1, switch S9, power transformer T1, line inductors L1201 and L1202.
Pilot lamp on. Display out, on impulse and circuit noise channels.	Power supply section. Check fuse F2, check low voltage regulators. Check +190 Vdc supply bus.
Display illuminated but no information on any impulse channel, display remains extinguished in the circuit noise channel at any input signal level.	Input circuit, input, amplifier, networks, or buffer amp section. Indicates possible loss of gain. Check for proper signal levels as compared with those outlined in the Block Diagram, Figure 7—1. Use 1-kHz signal from 600-ohm source impedance with known level. Set MINIMUM LEVEL control to corresponding sensitivity in dBrn. Use high impedance ac voltmeter to measure signal levels at indicated points on block diagram. With malfunction localized in a given section, make necessary dc measurements to isolate defective component. Refer to appropriate schematics for circuit configuration and dc voltages. Refer to the circuit description, Section 4.
Display illuminated, but no information on impulse channels. Normal operation in the circuit noise channel.	Channel A amplifier-detector, inhibit logic, or blanking interval timing and control logic section. Check for adequate signal level at input of channel A amplifier. Check for proper dc voltages and waveforms associated with the indicated sections. Refer to the block diagram and schematics. See Circuit Description Section 4. NOTE Timer must be in the CONTINUOUS position or in the Timing position.
One impulse channel inoperative. Does not accumulate counts. i.e. channel C other channels normal.	Channel C amplifier-detector gate or control flip-flop section. Check for adequate signal level at input of channel C amplifier. Check for proper dc voltages and waveforms associated with the indicated sections. Refer to Block diagram; schematics and Circuit Description Section 4.
Partial information displayed. One digit inoperative on one impulse channel only. i.e. Channel B.	Channel B counters or gate matrix section. Check Integrated Circuit associated with that digit in both sections. Test Integrated Circuits by substitution.
Partial information displayed. All digits illuminated but one is inoperative on all Impulse channels.	Check latch, decoder driver, 7 segment display associated with that digit. Test Integrated Circuits by substitution.
Display will not reset to zero on any impulse channel.	Check reset logic section Check IC1001 and associated circuitry Check reset switch S11

Table 5—2. (Cont'd)

SYMPTOM	PROBABLE LOCATION AND CAUSE OF MALFUNCTION
Display and overrange lamp remain extinguished at any input signal level in the circuit noise channel. Partial or no output level from monitor section.	Attenuator or circuit noise amplifier section. Indicates loss of gain. Check for proper signal levels as indicated on block diagram. Check for proper dc voltages. Check attenuator section S3-D2. Check integrated circuit IC901 and associated circuitry.
Partial or no output level from monitor section. Normal operation on all channels.	monitor amplifier section. Check integrated circuit Q901 and assoicated circuitry. Check output level control R2 and output jack J13.
Display and overrange lamp remain extinguished at any input signal level in the circuit noise channel. Monitor section operates normally.	Ac-dc converter, DC-Log converter control logic, counters, or the 400 Hz clock. Check dc voltages and waveforms associated with the dc-log converter. Check dc voltages and waveforms assoicated with control logic. Check counters and 400 Hz clock. Refer to block diagram, schematics and the Circuit Description, Section 4.
All other malfunctions associated with the circuit noise channel.	Same as above
Tens digit inoperative when in the circuit noise channel. Digit does not indicate correct decade level in dBrn.	Check intergrated circuit IC535 by substitution. See circuit description, Section 4.

5.7 CIRCUIT NOISE CHANNEL CALIBRATION: GENERAL

If it is found necessary to recalibrate, first determine in what section the error exists.

1. With conditions outlined in paragraph 5.6, decrease input level to −20 dBm.

2. Refer to block diagram and use indicated levels for reference.

3. If the error is found to exist at the input of the 47 dB amplifier, IC901, then the problem is common to all channels. This would indicate that the amplifier gain control R219 associated with the buffer amplifier or the amplifier gain control R210 associated with the C-MSG Amplifier are out of adjustment.

4. Switch to FLAT NETWORK. If error still exists, adjust R219. If error no longer exists, R210 needs adjustment.

5. If error is found to exist at the output of the 47 dB Amplifier, IC901, this would indicate that the Amplifier Gain Control R905 needs adjustment.

6. If the level at the output of amplifier IC901 is correct, measure the dc voltage at the output of the AC-DC converter. This sould be −1.5 volts +0, −5%. Adjust dc gain control R929 associated with the dc amplifier IC902 if this voltage is incorrect.

5.8 DC-LOG CONVERTER CALIBRATION

1. Set-up Model 58B front panel controls as in paragraph 5.6.

2. Connect a 1-kHz signal from a 600-ohm source to the line input of the Model 58B.

3. Adjust input level to read exactly 70 dBrn on Model 58B.

4. Increase input level by 12 dB in 1 dB steps and not tracking accuracy. Error, if any, should remain within ±0.1 dB.

5.9 If tracking deviates from that specified in paragraph 5.8, proceed as follows:

1. IMPORTANT: Power must be off and sufficient time allowed to assure that the +190 volt dc bus has deteriorated before proceeding.

2. Locate printed circuit board 7, E95500. Remove it from the card cage and place on extender card.

3. Re-apply power to Model 58B, and with conditions as in paragraph 5.9, measure the dc voltage at TP 7.5.

NOTE

This voltage must be measured with a high input impedance dc voltmeter. Use NEC Model 2000 or equivalent. This voltage should be between +1.45 V and +1.5 Vdc. If not, adjust R706.

4. Readjust input signal level to read exactly 70 dBrn and then increase input level by exactly 10 dB. If necessary, adjust 10 dB cal. control R715 to read 80 dBrn ±0.1 dB.

5. Decrease input level by 5 dB. If necessary, adjust SLOPE control R713 to read 75 dBrn ±0.1 dB.

6. Repeat steps 4 and 5 for required accuracy.

5.10 IMPULSE CHANNEL CALIBRATION CHECK

1. Set up Model 58B front panel controls as follows:

PUSHBUTTONS	600 ohms TERM BAL-XFMR
NETWORK	C-MSG
SELECTOR	Impulse channel being checked
MINIMUM LEVEL	40 dBrn
INCREMENT	0-2-4-6 dBrn
TIMER	Continuous position
BLANKING	Set for 10 PPS

2. Connect a 1-kHz signal with a level of −53 dBm from a 600 ohm source to the line input of the Model 58B.

3. Set SELECTOR to channel A and adjust input signal level for visual periodic count accumulation at threshold. Resulting input signal level should be within ±0.5 dB of −53 dBm.

4. Check channels B, C, and D in the same manner with input signal levels of −51 dBm, −49 dBm and −47 dBm respectively. All should be within ±0.5 dB accuracy.

5.11 If one or more channels need to be recalibrated, proceed as follows:

1. If channel A needs to be recalibrated, remove printed circuit board 3, E95501, from card cage and place on card extender. Use short clip leads to establish connection between disconnected cable andprinted circuit board input terminals.

CAUTION

The case of series pass transistor Q1 is at +9 Vdc. Any momentary short will open 3A fuse F2.

2. With power re-applied to the Model 58B and same conditions existing as in paragraph 5.10 steps 2 and 3, place SELECTOR switch to channel A and adjust SENS. CAL. control R316 for visual periodic count accumulation.

3. Decrease input level by 0.2 dB. Count accumulation should stop. Increase input level by 0.4 dB and a full count rate of 10 PPS should be observed.

5.12 If the amplifier integrated circuit IC301 has been replaced, the BALANCE control R302 may require readjustment to insure equal channel sensitivity to both polarities of the input signal, proceed as follows:

1. Connect oscilloscope to PT3.3 located on printed circuit board 3. Adjust oscilloscope for positive internal triggering with horizontal time base set for 0.1 ms/cm.

2. Increase input signal level to 52 dBm and adjust oscilloscope for correct horizontal triggering.

3. Observe waveform and adjust BALANCE control R302 for a recurring rectangular pulse every 0.5 ms. This is an indication that the channel A detector is triggering on both polarities of the input signal.

4. Decrease input level to −53 dBm and adjust SENS. CAL. control R316 for visula periodic count accumulation.

5. At this threshold level, only one will be observed. Increasing input level by 0.2 or 0.3 dB should result in a pulse every 0.5 ms. Correct adjustment of the BALANCE control is indicated when triggering of both polarities of the input signal occurs within 0.5 dB of threshold.

5.13 Impulse channels B, C, and D are similar in operation to channel A. Use the same calibration instructions outlined for channel A observing the correct threshold levels relative to each channel.

5.14 TO CHECK WEIGHTING NETWORK LEVEL EQUALIZATION

1. Set-up Model 58B front panel controls as follows:

PUSHBUTTONS	600 ohms TERM
	BAL-XFMR
NETWORK	10.2-51 kHz
SELECTOR	CIRCUIT NOISE
MINIMUM LEVEL	70 dBrn
POWER	ON

2. Connect a 25-kHz signal with a level of −10 dBm from a 600-ohm source to the line input of the Model 58B. The Model 58B should read 80 dBrn ± 0.3 dBm.

3. Change input signal frequency to 1 kHz at a signal level of −10 dBm.

4. Switch NETWORK control to both C-MSG and FLAT. Set should read same level ±0.1 dB as that indicated when in the 10.2-51 kHz NETWORK.

5.15 If recalibration is found to be necessary, proceed as follows:

1. Locate printed circuit board 2, E95510 and remove from card cage. Place on extender card.

2. With conditions outlined in paragraph 5.14, steps 1 and 2, recalibrate by adjusting R210 for C-MSG weighting, level correction and/or R216 for FLAT weighting level correction.

5.16 Input balance controls, C104, C105, C106, R121 and R122 are factory adjustments. Replacement of the input amplifier IC101 may require re-adjustment of these controls. It is recommended that the input module section or entire set be returned to the factory if the Common Mode Rejection is believed to have deteriorated.

SECTION 6

ELECTRONIC PARTS LIST

6.1 INTRODUCTION

6.2 The following pages contain the parts list for the Model 58B Impulse Counter and Noise Measuring Set.

Table 6—1. Input Circuit And Impedance Parts List

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-022
INPUT CKT + LINE SECTION PAGE 1 REV 12 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
C102	22UF		10%	150V	SPRAGUE	10SD226X9150T2	310702260
C103	22UF		10%	150V	SPRAGUE	10SD226X9150T2	310702260
R29	15K	1/4W	10%		AB	TYPE CB	200101536
R30	15K	1/4W	10%		AB	TYPE CB	200101536
R101	110-	1/2W	5%		AB	TYPE EB	200201115
R102	110-	1/2W	5%		AB	TYPE EB	200201115
R103	499-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220249901
R104	39.2K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220239221
R105	20.5K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220220521
R106	487-	1/2W	1%		ELECTRA	RN65 SIZE 100 PPM	220648701
R107	316-	1/2W	1%		ELECTRA	RN65 SIZE 100 PPM	220631601
R108	75-	1/2W	1%		ELECTRA	RN65 SIZE 100 PPM	220675091
R109	68.1-	1/2W	1%		ELECTRA	RN65 SIZE 100 PPM	220668191
R110	20.5K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220220521
R111	487-	1/2W	1%		ELECTRA	RN65 SIZE 100 PPM	220648701
R112	316-	1/2W	1%		ELECTRA	RN65 SIZE 100 PPM	220631601
R113	75-	1/2W	1%		ELECTRA	RN65 SIZE 100 PPM	220675091
R114	68.1-	1/2W	1%		ELECTRA	RN65 SIZE 100 PPM	220668191
S12-20	9POS SPECIAL				CRL	2KBM035100-292	635800500

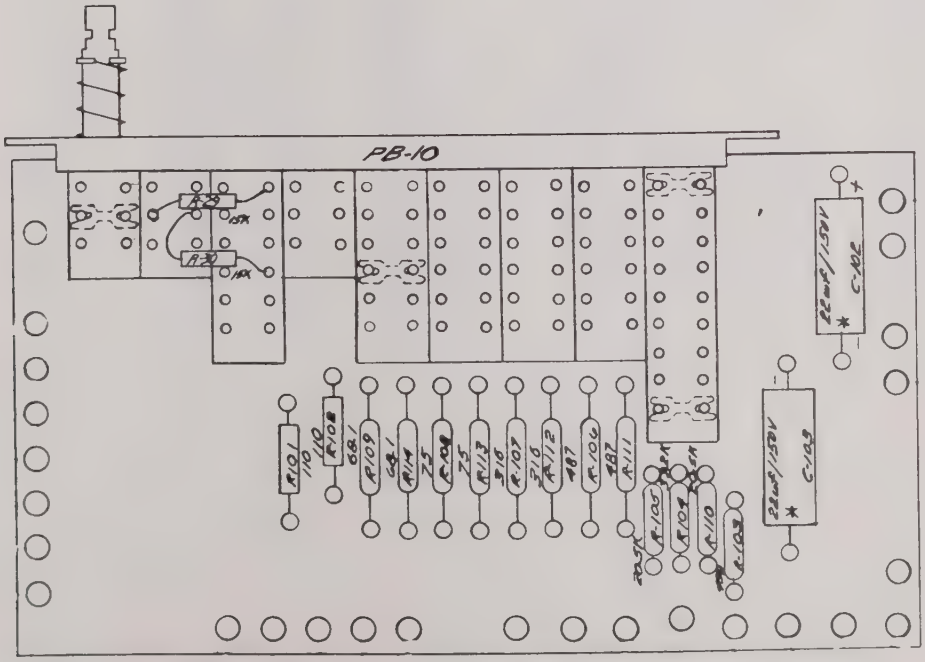


Figure 6—1. Input Circuit And Impedance Parts Location Diagram

D0058-20-022

Table 6—2. Input Amplifier Parts List

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-023
INPUT AMP. PAGE 1 REV 12 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
C101	1UF	Z5U TC	20%	50V	SPRAGUE	5C023105X0500C5	330501050
C104-106	1.5-8PF			200V	ERIE	539-002A-1.5-8	340100801
C107	680PF DB	Z5R	10%	1KV	CENTRALAB	DD-681	330006810
C108	1000PF DC	Z5R	10%	1KV	CENTRALAB	DD-102	330001020
C109	22PF DA	N330	10%	1KV	CENTRALAB	DD-220	330002200
C110	22UF		10%	6V	KEMET	T330A226K006AS	310002260
C111-112	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C113-114	50UF			16V	SPRAGUE	TE1160	300205060
C115	1UF	Z5U TC	20%	50V	SPRAGUE	5C023105X0500C5	330501050
C116	3.9PF DB	NPO	5%	1KV	SPRAGUE	10TCC-V39	330303990
CR101-102	DO35 4NS 10MA	SI	50UA		FAIRCHILD	IN4148	560041480
K101-105	4K			24V	RANDALL	24MMIC	602200100
Q101	TO92 200MW TA	N		25V	MOTOROLA	MPF103 2N5457	554001030
Q102	TO-92 350MW TA	NPN		40V	MOTOROLA	2N3903	550039030
R115-116	12.4K	1/8W	1%		IRC	RN55 SIZE 25 PPM	221012421
R117	124K	1/8W	1%		IRC	RN55 SIZE 25 PPM	221012431
R118	4.059K	1/8W	1%		IRC	RN55 SIZE 25 PPM	221040511
R119	3.784K	1/8W	1%		IRC	RN55 SIZE 25 PPM	221037811
R120	200-	1/8W	1%		IRC	RN55 SIZE 25 PPM	221020001
R121	200#	.25W			CTS	UPE200RE1-SW1442	231302010
R122	2K	.25W			CTS	UPE200RE1-SW1817	231302020
R123	2K	1/8W	1%		IRC	RN55 SIZE 25 PPM	221020011
R124	121K	1/8W	1%		IRC	RN55 SIZE 25 PPM	221012131
R125	680-	1/4W	10%		AB	TYPE CB	200106816
R126	1.5K	1/4W	10%		AB	TYPE CB	200101526
R127	1M	1/4W	10%		AB	TYPE CB	200101056
R128	1.8K	1/4W	10%		AB	TYPE CB	200101826
R129	600-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220260001
R130	630.9-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220263001
R131	1.262K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220212611
R132	1540-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220215411
R133	12.25K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220212221
R134	1150-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220211511
R135	976-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220297601
R136-137	27-	1/4W	10%		AB	TYPE CB	200102706
U101	14DILP				TI	SN72709N	500007090

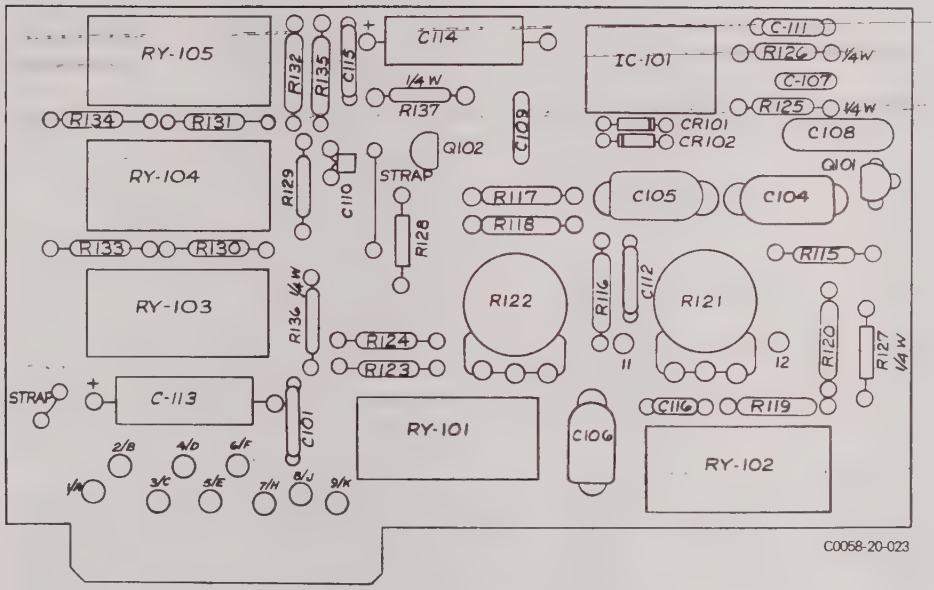


Figure 6—2. Input Amplifier Parts Location Diagram

Table 6—3. Buffer Amplifier Parts List (Sheet 1 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-024
PC BRD ASSY E 95510 — PAGE 1 REV 14 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
C201	.2UF		10%	80V	F-DYNE	PE23-.2-80-10	322102040
C202	1UF		10%	35V	KEMET	T330A105K035AS	310001051
C203	.2UF		10%	80V	F-DYNE	PE23-.2-80-10	322102040
C204	.15UF		10%	80V	SPRAGUE	192P1549R8	321101540
C205	.25UF		10%	80V	F-DYNE	PE12-.25-80-10	322102540
C206	.2UF		10%	80V	F-DYNE	PE23-.2-80-10	322102040
C207	2.2UF		10%	35V	KEMET	T330A225K035AS	310002250
C208	22UF		10%	6V	KEMET	T330A226K006AS	310002260
C209	22UF		10%	6V	KEMET	T330A226K006AS	310002260
C210	2.2UF		10%	35V	KEMET	T330A225K035AS	310002250
C211	22UF		10%	6V	KEMET	T330A226K006AS	310002260
C212	.03UF		10%	100V	F-DYNE	PE22-.030-100-10	322103036
C213	.03UF		10%	100V	F-DYNE	PE22-.030-100-10	322103036
C214	.006UF		10%	100V	F-DYNE	PE12-.006-100-10	322106026
C215	.006UF		10%	100V	F-DYNE	PE12-.006-100-10	322106026
C216	22UF		10%	6V	KEMET	T330A226K006AS	310002260
C217	.039UF		10%	100V	SPRAGUE	225P39391WD3	320003930
C218	1UF	Z5U TC	20%	50V	SPRAGUE	5C023105X0500C5	330501050
C219	1UF	Z5U TC	20%	50V	SPRAGUE	5C023105X0500C5	330501050
C220	510PF DB	Z5R	10%	1KV	CENTRALAB	DD-511	330005110
C221	22PF DA	N330	10%	1KV	CENTRALAB	DD-220	330002200
C222	22UF		10%	6V	KEMET	T330A226K006AS	310002260
C223	100UF			16V	SPRAGUE	TE-1162	300201071
C224	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C225	300UF			3V	C.DUBILIER	NLW-300-3	300303070
C226	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C227	100UF			16V	SPRAGUE	TE-1162	300201071
C228	100UF			16V	SPRAGUE	TE-1162	300201071
CR201	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR202	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR203	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR204	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR205	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR206	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
IC201	14DILP				TI	SN72709N	500007090
L201	150MH	22MA	2%		TRIAD	EA-150	460100200
L202	30MH	50MA	2%		TRIAD	EA-030	460100100
L203	30MH	50MA	2%		TRIAD	EA-030	460100100
L204	7.5MH				DELEVAN	2500-70	450300200
L205	2.7MH				DELEVAN	2500-48	450300100
Q201	TO-92	350MW TA	NPN	40V	MOTOROLA	2N3903	550039030
Q202	TO92	350MW TC	PNP	40V	MOTOROLA	2N3905	552039050
Q203	TO-92	350MW TA	NPN	40V	MOTOROLA	2N3903	550039030
R201	681-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220268101
R202	619-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220261901
R203	85-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220285091
R204	1.8K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220218011
R205	183.7	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220200001

Table 6—3. Buffer Amplifier Parts List (Sheet 2 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-024
PC BRD ASSY E-95510 — PAGE 2 REV 14 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TCL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
R206	619-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220261901
R207	22K	1/4W	10%		AB	TYPE CB	200102236
R208	330K	1/4W	10%		AB	TYPE CB	200103346
R209	12K	1/4W	10%		AB	TYPE CB	200101236
R210	500#	.25W			CTS	UPE200RE1-SQ8515	231305010
R211	330-	1/4W	10%		AB	TYPE CB	200103316
R212	470-	1/4W	10%		AB	TYPE CB	200104716
R213	680-	1/4W	10%		AB	TYPE CB	200106816
R214	820-	1/4W	10%		AB	TYPE CB	200108216
R215	1180-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220211811
R216	20K	.25W			CTS	UPE200RE1-SQ8518	231302030
R217	100-	1/4W	10%		AB	TYPE CB	200101016
R218	2.49K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220224911
R219	5K	.25W			CTS	UPE200RE1-SQ8516	231305020
R220	4020-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220240211
R221	1.5K	1/4W	10%		AB	TYPE CB	200101526
R222	3.9K	1/4W	10%		AB	TYPE CB	200103926
R223	56-	1/4W	10%		AB	TYPE CB	200105606
R224	100-	1/4W	10%		AB	TYPE CB	200101016
R225	33K	1/4W	10%		AB	TYPE CB	200103336

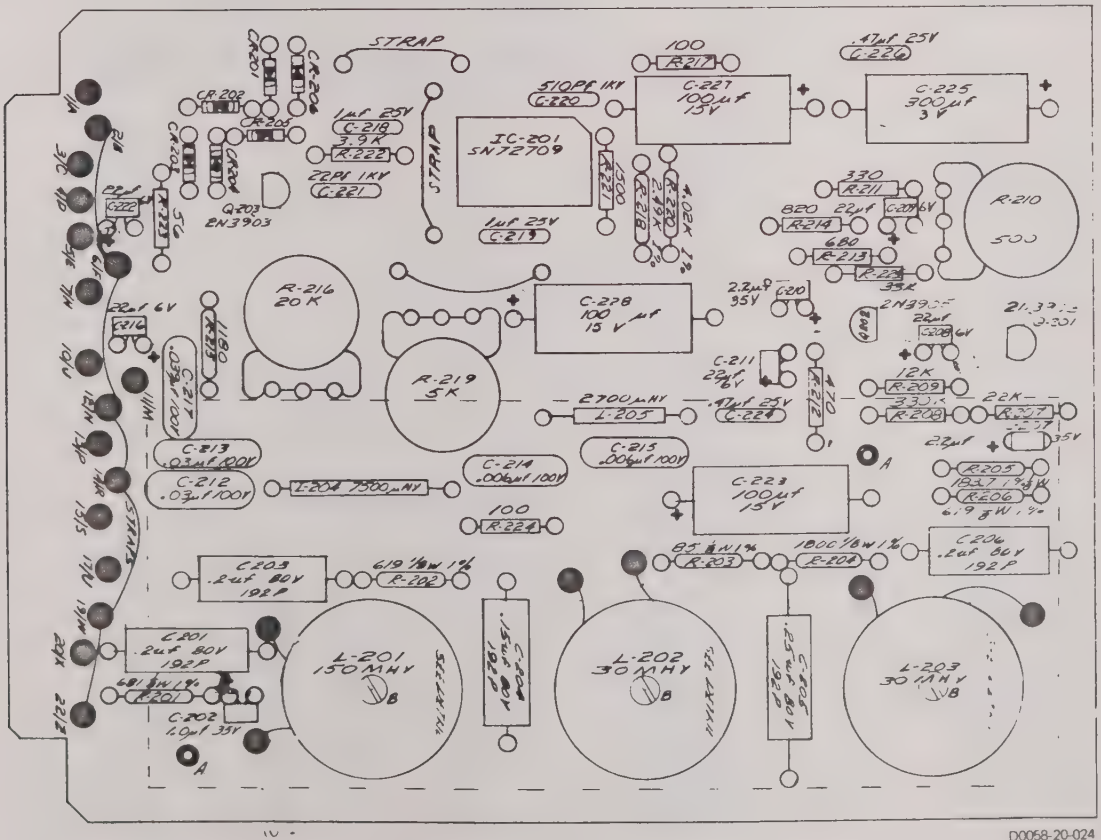


Figure 6—3. Buffer Amplifier Parts Location Diagram

Table 6—4. Channel A And Inhibit Circuit Parts List (Sheet 1 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-025
PC BRD ASSY E 95501 — PAGE 1 REV 10 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
C301	1.0UF	ME Y5V	20%	100V	ERIE	8141-100-651-105M	330801051
C302	.47UF	MD Y5V	20%	50V	ERIE	8131-050-651-474M	330804740
C303	100PF	DB N3300	10%	1KV	CENTRALAB	DD-101	330001010
C304	3.3PF	CA N330		1KV	CENTRALAB	DD-3R3	330003390
C305	.47UF	MD Y5V	20%	50V	ERIE	8131-050-651-474M	330804740
C306	5UF			16V	SPRAGUE	TE1152	300205050
C307	330PF	DB Z5F	10%	1KV	CENTRALAB	DD-331	330003310
C308	.47UF	MD Y5V	20%	50V	ERIE	8131-050-651-474M	330804740
C309	.47UF	MD Y5V	20%	50V	ERIE	8131-050-651-474M	330804740
C310	150PF	DB N3300	10%	1KV	CENTRALAB	DD-151	330001510
C311	33PF	DA N330	10%	1KV	CENTRALAB	DD-330	330003300
C312	.47UF	MD Y5V	20%	50V	ERIE	8131-050-651-474M	330804740
C313	2.2UF		10%	35V	KEMET	T330A225K035AS	310002250
C314	SELVAL		10%		SPRAGUE	225P	320000000
C315	.22UF		10%	50V	KEMET	T330A224K050AS	310002240
C316	SELVAL		10%		SPRAGUE	225P	320000000
C317	22UF		10%	6V	KEMET	T330A226K006AS	310002260
C318	SELVAL		10%		SPRAGUE	225P	320000000
C319	.022UF		10%	100V	SPRAGUE	225P22391WD3	320002230
C320	SELVAL		10%		SPRAGUE	225P	320000000
C321	22UF		10%	6V	KEMET	T330A226K006AS	310002260
C322	150PF	DB N3300	10%	1KV	CENTRALAB	DD-151	330001510
CR301-305	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR306	A16Z	80MW	GE	50V	TRANS.	1N198	561001980
IC301	14DILP				TI	SN72709N	500007090
IC302	14DILP				TI	SN72709N	500007090
IC303	10P TO-5				RCA	CA3019T	500030190
IC304	14DIP-P			TTL	TI	SN7410N	510074100
IC305	14DIP-P			TTL	TI	SN7410N	510074100
IC306	16DIP-P			UTL	SIGNETICS	SP322B	510003220
IC307	16DIP-P			UTL	SIGNETICS	SP322B	510003220
IC308	14DIP-P			UTL	SIGNETICS	SP380A	510003800
J17-18	TEST JACK R/A PC BLK				H H SMITH	499-103	652900100
Q301-306	TO-92	350MW TA	NPN	40V	MOTOROLA	2N3903	550039030
R301	10K	1/2W	10%		AB	TYPE EB	200201036
R302	10K	1/2W	10%	200V	BOURNS	3386M-1-103	232701032
R303	10K	1/2W	10%		AB	TYPE EB	200201036
R304	1300-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220213011
R305	1.5K	1/2W	10%		AB	TYPE EB	200201526
R306	40.2K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220240221
R307-308	22K	1/2W	10%		AB	TYPE EB	200202236
R309	3.9K	1/2W	5%		AB	TYPE EB	200203925
R310	1K	1/2W	10%		AB	TYPE EB	200201026
R311	1K	1/2W	10%		AB	TYPE EB	200201026
R312	560K	1/2W	10%		AB	TYPE EB	200205646
R313	3.6K	1/2W	5%		AB	TYPE EB	200203625
R314	3.9K	1/2W	5%		AB	TYPE EB	200203925
R315	360-	1/2W	5%		AB	TYPE EB	200203615

Table 6—4. Channel A And Inhibit Circuit Parts List (Sheet 2 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-025
PC BRD ASSY E 95501 — PAGE 2 REV 10 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
R316	1K	1/2W	10%	200V	BOURNS	3386M-1-102	232701021
R317	1K	1/2W	10%		AB	TYPE EB	200201026
R318	3.3K	1/2W	10%		AB	TYPE EB	200203326
R319	100-	1/2W	10%		AB	TYPE EB	200201016
R320	1K	1/2W	10%	200V	BOURNS	3386M-1-102	232701021
R321	510-	1/2W	5%		AB	TYPE EB	200205115
R322	10K	1/2W	10%		AB	TYPE EB	200201036
R323	91K	1/2W	5%		AB	TYPE EB	200209135
R324	10K	1/2W	10%		AB	TYPE EB	200201036
R325	91K	1/2W	5%		AB	TYPE EB	200209135
R326	10K	1/2W	10%		AB	TYPE EB	200201036
R327	10K	1/2W	10%		AB	TYPE EB	200201036
R328	510-	1/2W	5%		AB	TYPE EB	200205115
R329	100-	1/2W	10%		AB	TYPE EB	200201016
R330	1M	1/2W	10%		AB	TYPE EB	200201056
R331	10K	1/2W	10%		AB	TYPE EB	200201036
R332	5.1K	1/2W	5%		AB	TYPE EB	200205125

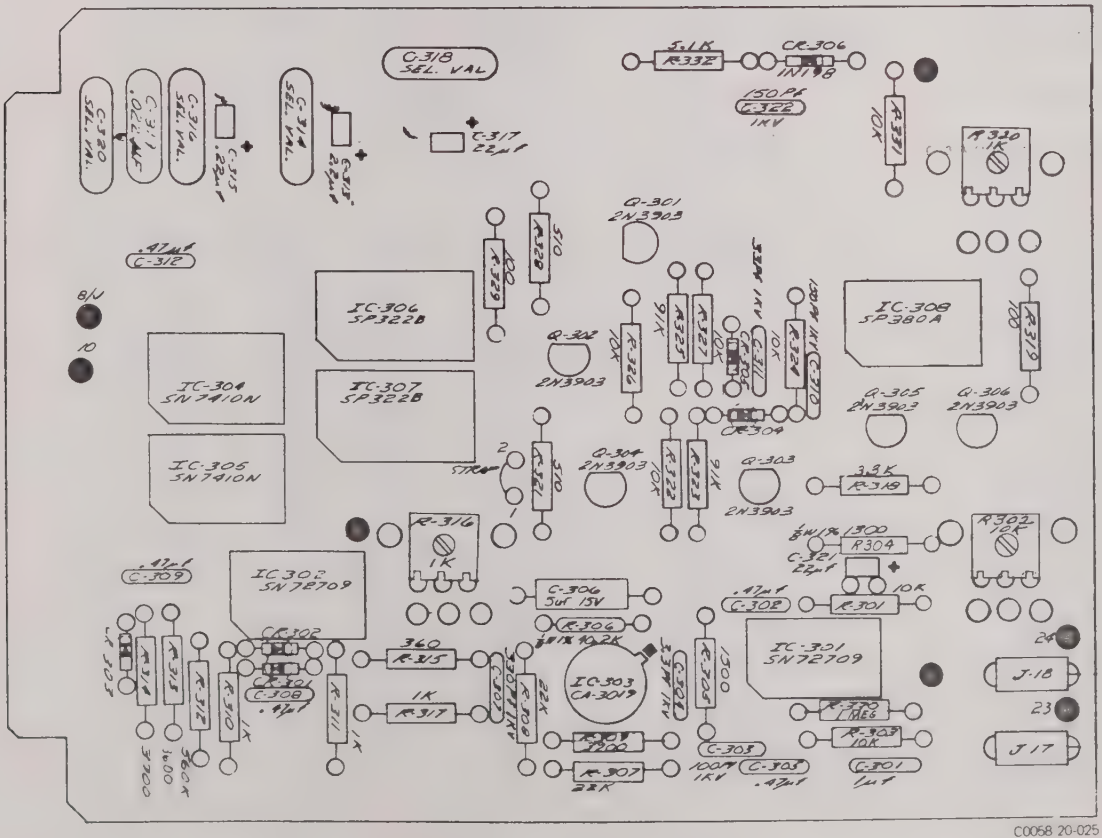


Figure 6—4. Channel A And Inhibit Circuit Parts Location Diagram

Table 6—5. Channel B, C, And D Level Detector Circuit Parts List (Sheet 1 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-026 PC4 CHANNEL B-C-D — PAGE 1 REV 09 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
C401	1.0UF ME	Y5V	20%	100V	ERIE	8141-100-651-105M	330801051
C402	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C403	100PF DB N3300		10%	1KV	CENTRALAB	DD-101	330001010
C404	3.3PF CA N330			1KV	CENTRALAB	DD-3R3	330003390
C405	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C406	5UF			16V	SPRAGUE	TE1152	300205050
C407	150PF DB N3300		10%	1KV	CENTRALAB	DD-151	330001510
C408-409	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C410	1.0UF ME	Y5V	20%	100V	ERIE	8141-100-651-105M	330801051
C411	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C412	100PF DB N3300		10%	1KV	CENTRALAB	DD-101	330001010
C413	3.3PF CA N330			1KV	CENTRALAB	DD-3R3	330003390
C414	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C415	5UF			16V	SPRAGUE	TE1152	300205050
C416	150PF DB N3300		10%	1KV	CENTRALAB	DD-151	330001510
C417-418	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C419	1.0UF ME	Y5V	20%	100V	ERIE	8141-100-651-105M	330801051
C420	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C421	100PF DB N3300		10%	1KV	CENTRALAB	DD-101	330001010
C422	3.3PF CA N330			1KV	CENTRALAB	DD-3R3	330003390
C423	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C424	5UF			16V	SPRAGUE	TE1152	300205050
C425	150PF DB N3300		10%	1KV	CENTRALAB	DD-151	330001510
C426-427	.47UF	Z5UTC	20%	25	SPRAGUE	5C023474X0500C5	330504740
C428-430	22UF		10%	6V	KEMET	T330A226K006AS	310002260
CR401-409	D035 4NS 10MA	SI	50UA		FAIRCHILD	IN4148	560041480
IC401-406	14DILP				TI	SN72709N	500007090
IC407-409	10P TO-5				RCA	CA3019T	500030190
R401	10K	1/2W	10%		AB	TYPE EB	200201036
R402	10K	1/2W	10%	200V	BOURNS	3386M-1-103	232701032
R403	10K	1/2W	10%		AB	TYPE EB	200201036
R404	1.5K	1/2W	10%		AB	TYPE EB	200201526
R405	40.2K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220240221
R406-407	22K	1/2W	10%		AB	TYPE EB	200202236
R408	3.9K	1/2W	5%		AB	TYPE EB	200203925
R409-410	1K	1/2W	10%		AB	TYPE EB	200201026
R411	560K	1/2W	10%		AB	TYPE EB	200205646
R412	6.8K	1/2W	5%		AB	TYPE EB	200206825
R413	3.9K	1/2W	5%		AB	TYPE EB	200203925
R414	360-	1/2W	5%		AB	TYPE EB	200203615
R415	1K	1/2W	10%	200V	BOURNS	3386M-1-102	232701021
R416	1K	1/2W	10%		AB	TYPE EB	200201026
R417	10K	1/2W	10%		AB	TYPE EB	200201036
R418	10K	1/2W	10%	200V	BOURNS	3386M-1-103	232701032
R419	10K	1/2W	10%		AB	TYPE EB	200201036
R420	1.5K	1/2W	10%		AB	TYPE EB	200201526
R421	40.2K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220240221
R422-423	22K	1/2W	10%		AB	TYPE EB	200202236
R424	3.9K	1/2W	5%		AB	TYPE EB	200203925
R425-426	1K	1/2W	10%		AB	TYPE EB	200201026

Table 6—5. Channel B, C, And D Level Detector Circuit Parts List (Sheet 2 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-026
PC4 CHANNEL B-C-D — PAGE 2 REV 09 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
R427	560K	1/2W	10%		AB	TYPE EB	200205646
R428	6.8K	1/2W	5%		AB	TYPE EB	200206825
R429	3.9K	1/2W	5%		AB	TYPE EB	200203925
R430	360-	1/2W	5%		AB	TYPE EB	200203615
R431	1K	1/2W	10%	200V	BOURNS	3386M-1-102	232701021
R432	1K	1/2W	10%		AB	TYPE EB	200201026
R433	10K	1/2W	10%		AB	TYPE EB	200201036
R434	10K	1/2W	10%	200V	BOURNS	3386M-1-103	232701032
R435	10K	1/2W	10%		AB	TYPE EB	200201036
R436	1.5K	1/2W	10%		AB	TYPE EB	200201526
R437	40.2K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220240221
R438	22K	1/2W	10%		AB	TYPE EB	200202236
R439	22K	1/2W	10%		AB	TYPE EB	200202236
R440	3.9K	1/2W	5%		AB	TYPE EB	200203925
R441-442	1K	1/2W	10%		AB	TYPE EB	200201026
R443	560K	1/2W	10%		AB	TYPE EB	200205646
R444	6.8K	1/2W	5%		AB	TYPE EB	200206825
R445	3.9K	1/2W	5%		AB	TYPE EB	200203925
R446	360-	1/2W	5%		AB	TYPE EB	200203615
R447	1K	1/2W	10%	200V	BOURNS	3386M-1-102	232701021
R448	1K	1/2W	10%		AB	TYPE EB	200201026
R449-451	1M	1/2W	10%		AB	TYPE EB	200201056

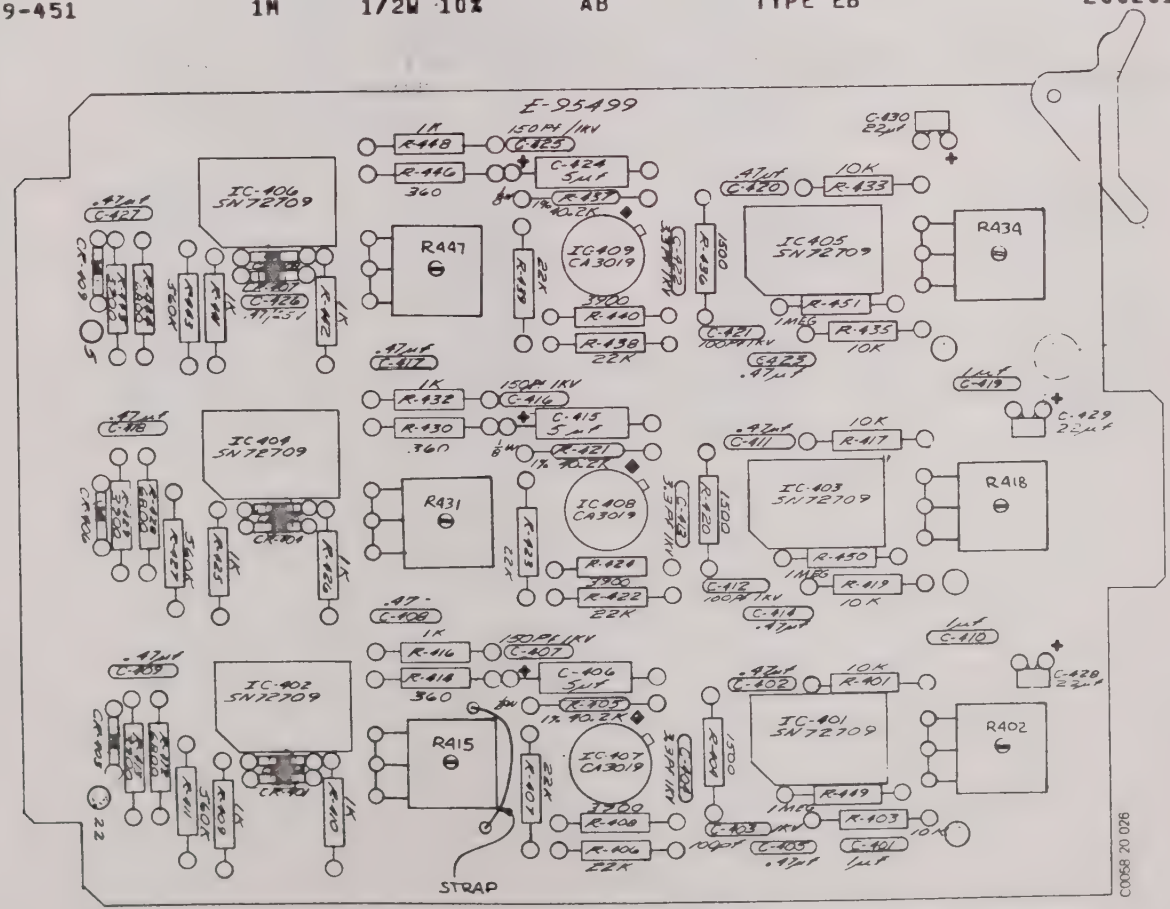


Figure 6—5. Channel B, C, And D Level Detector Circuit Parts Location Diagram

Table 6—6. Counter And Gate Matrix Parts List

N O R T H E A S T E L E C T R O N I C S

REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-027
PC BRD ASSY E 95502 PAGE 1 REV 05 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
20	14DIP-P				TTL TI	SN7490AN	510074900
521-524	14DIP-P				TTL TI	SN7401N	510074010
525-528	14DIP-P				TTL TI	SN7490AN	510074900
529-534	14DIP-P				TTL TI	SN7401N	510074010
536	14DIP-P				TTL TI	SN7401N	510074010
C501-503	.01UF		00	50V	CENTRALAB	CK-103	330701030
C504	100UF			16V	SPRAGUE	TE-1162	300201071
C505	100UF			16V	SPRAGUE	TE-1162	300201071
C506	.01UF		00	50V	CENTRALAB	CK-103	330701030
C507	.01UF		00	50V	CENTRALAB	CK-103	330701030
CR501	A16Z	80MW	GE	50V	TRANS.	1N198	561001980
CR502	A16Z	80MW	GE	50V	TRANS.	1N198	561001980
R501-516	8.2K	1/2W	10%		AB	TYPE EB	200208226
R517	560-	1/2W	10%		AB	TYPE EB	200205616
R518-522	10K	1/2W	10%		AB	TYPE EB	200201036
U501-504	14DIP-P				TTL TI	SN7490AN	510074900
U505-508	14DIP-P				TTL TI	SN7401N	510074010
U509-512	14DIP-P				TTL TI	SN7490AN	510074900
U513-516	14DIP-P				TTL TI	SN7401N	510074010
U517-5	14DIP-P				TTL TI	SN7490AN	510074900
U535	14DIP-P				TTL TI	SN7482N	510074820
U537	16DIP-P				TTL TI	SN7475N	510074750
U538	16DIP-P				TTL TI	SN7475N	510074750
U539	16DIP-P				TTL TI	SN7475N	510074750
U540	16DIP-P				TTL TI	SN7475N	510074750

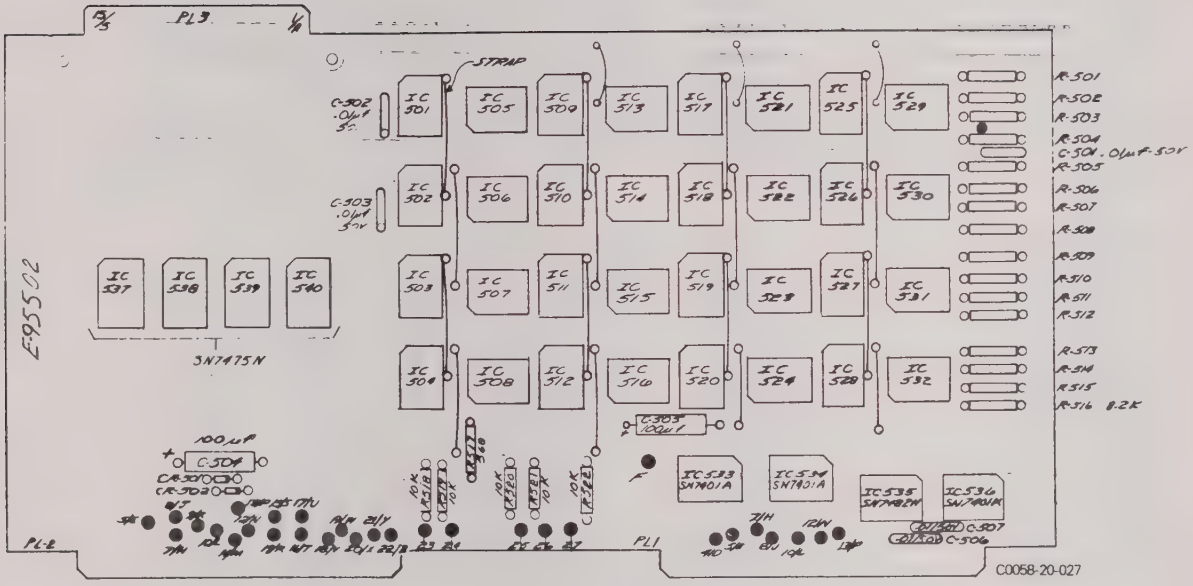


Figure 6—6. Counter And Gate Matrix Parts Location Diagram

Table 6—7. Power Supply Parts List (Sheet 1 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-028
PC BRD ASS'Y E 95480 — PAGE 1 REV 10 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
C602-605	250UF			50V	SPRAGUE	39D257G050HE4	300002570
C602-605	250UF			50V	SPRAGUE	39D257G050HE4	300002570
C606	100UF			16V	SPRAGUE	TE-1162	300201071
C606	100UF			16V	SPRAGUE	TE-1162	300201071
C607-608	50UF			250V	SPRAGUE	39D506F250JE4	300005061
C607-608	50UF			250V	SPRAGUE	39D506F250JE4	300005061
C609-611	200UF			16V	C.CUBILIER	NLW-200-16	300902070
C609-611	200UF			16V	C.CUBILIER	NLW-200-16	300902070
C612	200PF	DB N3300	10%	1KV	CENTRALAB	DD-201	330002010
C612	200PF	DB N3300	10%	1KV	CENTRALAB	DD-201	330002010
C613	5000PF	DE Z5U	GMV	1KV	CENTRALAB	DD-502	330005020
C613	5000PF	DE Z5U	GMV	1KV	CENTRALAB	DD-502	330005020
C614	200PF	DB N3300	10%	1KV	CENTRALAB	DD-201	330002010
C614	200PF	DB N3300	10%	1KV	CENTRALAB	DD-201	330002010
C615	5000PF	DE Z5U	GMV	1KV	CENTRALAB	DD-502	330005020
C615	5000PF	DE Z5U	GMV	1KV	CENTRALAB	DD-502	330005020
C616	1.0UF	ME Y5V	20%	100V	ERIE	8141-100-651-105M	330801051
C616	1.0UF	ME Y5V	20%	100V	ERIE	8141-100-651-105M	330801051
CR601-602		IF 1A		200V	INT RECT	10D2	560000510
CR601-602		IF 1A		200V	INT RECT	10D2	560000510
CR603-604	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR603-604	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR605	A1	400MW	5%	5.1V	DICKSON	1N751A	562007511
CR605	A1	400MW	5%	5.1V	DICKSON	1N751A	562007511
CR606	DO7	.25W	5%	6.2V	DICKSON	1N823	563008230
CR606	DO7	.25W	5%	6.2V	DICKSON	1N823	563008230
CR607		1.5A		500V	EDAL	B285-50	565030580
CR607		1.5A		500V	EDAL	B285-50	565030580
CR608		1.5A		600V	EDAL	B285-60	565030640
CR608		1.5A		600V	EDAL	B285-60	565030640
CR609	DO7	400MW	5%	24V	COMP DIODE	1N5708	562009702
CR609	DO7	400MW	5%	24V	COMP DIODE	1N5708	562009702
Q601-602	TO-92	350MW TA	NPN	25V	MOTOROLA	MPS6515	550065150
Q601-602	TO-92	350MW TA	NPN	25V	MOTOROLA	MPS6515	550065150
Q603	TO-92	350MW TA	NPN	40V	MOTOROLA	2N3903	550039030
Q603	TO-92	350MW TA	NPN	40V	MOTOROLA	2N3903	550039030
Q604	101	IT1.6A		50V	MOTOROLA	2N1595	556015950
Q604	101	IT1.6A		50V	MOTOROLA	2N1595	556015950
Q605	MODTO220	30W TC	NPN	60V	TI	TIP29A	552000291
Q605	MODTO220	30W TC	NPN	60V	TI	TIP29A	552000291
Q606	MODTO220	30W TC	PNP	40V	TI	TIP30	552000300
Q606	MODTO220	30W TC	PNP	40V	TI	TIP30	552000300
R601	15-	1/2W	10%		AB	TYPE EB	200201506
R601	15-	1/2W	10%		AB	TYPE EB	200201506
R602	30-	1W	5%		OHMITE	LITTLE DEVIL	200703005
R602	30-	1W	5%		OHMITE	LITTLE DEVIL	200703005
R603-604	620-	1/2W	5%		AB	TYPE EB	200206215
R603-604	620-	1/2W	5%		AB	TYPE EB	200206215
R605	700-	1W	5%		W LEONARD	TYPE 1X	210107015
R605	700-	1W	5%		W LEONARD	TYPE 1X	210107015

Table 6—7. Power Supply Parts List (Sheet 2 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-028
PC BRD ASS'Y E-95480 — PAGE 2 REV 10 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
R606	1K	.25W			CTS	UPE200RE1-SR932C	231301020
R606	1K	.25W			CTS	UPE200RE1-SR9320	231301020
R607	3830-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220238311
R607	3830-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220238311
R608	11.8K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220211821
R608	11.8K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220211821
R609	1K	1/2W	10%		AB	TYPE EB	200201026
R609	1K	1/2W	10%		AB	TYPE EB	200201026
R610	12.1K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220212121
R610	12.1K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220212121
R611	2K	.25W			CTS	UPE200RE1-SW1817	231302020
R611	2K	.25W			CTS	UPE200RE1-SW1817	231302020
R612	12.1K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220212121
R612	12.1K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220212121
R613	4530-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220245311
R613	4530-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220245311
R614	2K	.25W			CTS	UPE200RE1-SW1817	231302020
R614	2K	.25W			CTS	UPE200RE1-SW1817	231302020
R615	5490-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220254911
R615	5490-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220254911
R616	1.5K	1/2W	10%		AB	TYPE EB	200201526
R616	1.5K	1/2W	10%		AB	TYPE EB	200201526
R617	2K	1/2W	5%		AB	TYPE EB	200202025
R617	2K	1/2W	5%		AB	TYPE EB	200202025
R618	1.5K	1/2W	10%		AB	TYPE EB	200201526
R618	1.5K	1/2W	10%		AB	TYPE EB	200201526
R619	1K	1/2W	10%		AB	TYPE EB	200201026
R619	1K	1/2W	10%		AB	TYPE EB	200201026
R620	470-	1/2W	5%		AB	TYPE EB	200204715
R620	470-	1/2W	5%		AB	TYPE EB	200204715
R621	470-	1/2W	5%		AB	TYPE EB	200204715
R621	470-	1/2W	5%		AB	TYPE EB	200204715
R622	200-	1/2W	5%		AB	TYPE EB	200202015
R622	200-	1/2W	5%		AB	TYPE EB	200202015
R623	100K	1/2W	10%		AB	TYPE EB	200201046
R623	100K	1/2W	10%		AB	TYPE EB	200201046
U601-602	14DILP				TI	SN72709N	500007090
U601-602	14DILP				TI	SN72709N	500007090
XQ604	SKT				ELCO	05-3303	826600100
XQ604	SKT				ELCO	05-3303	826600100

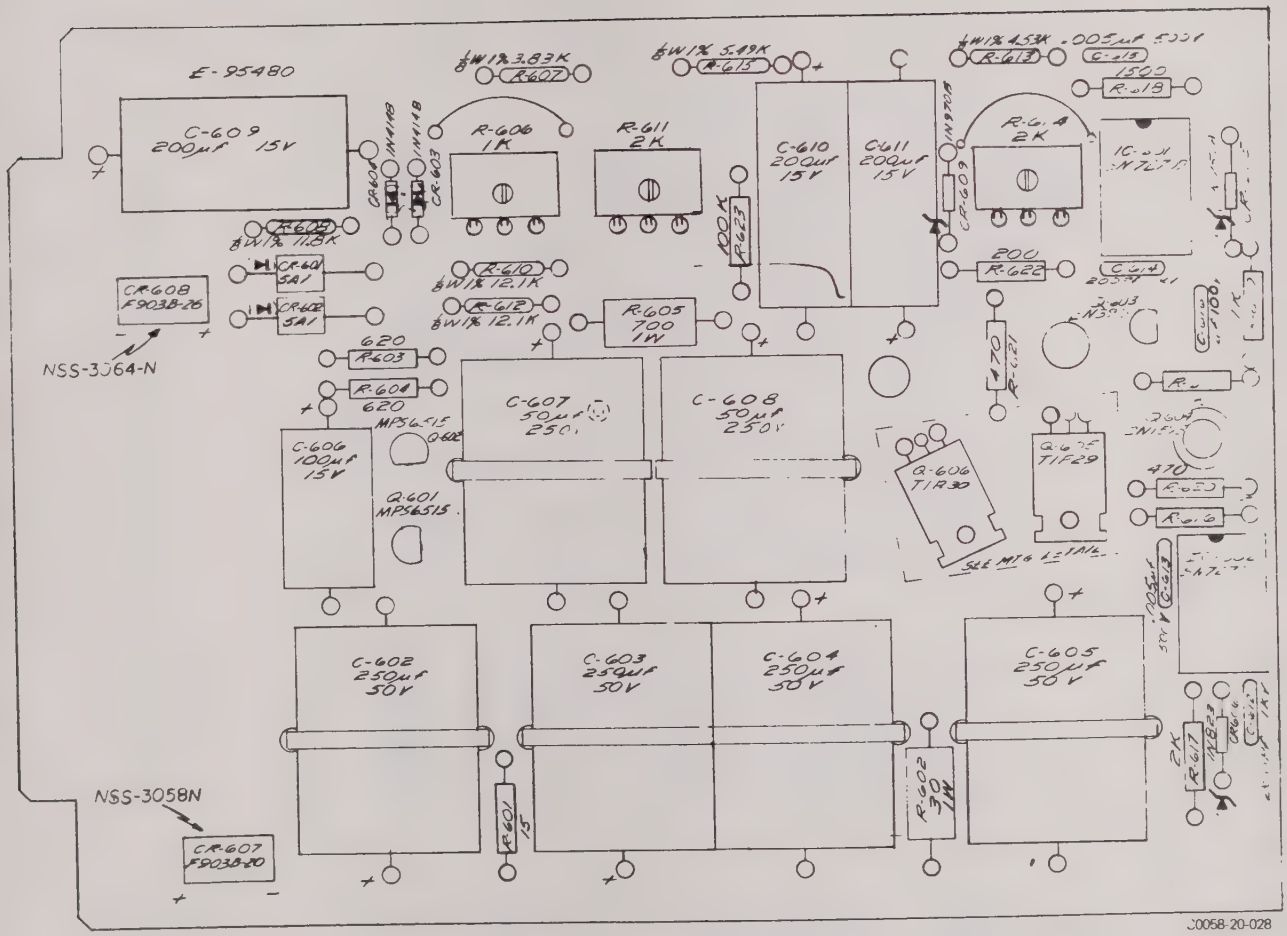


Figure 6—7. Power Supply Parts Location Diagram

Table 6—8. DC-LOG Converter And Control Logic Parts List (Sheet 1 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-029
PC BRD ASSY E 95500 — PAGE 1 REV 14 DATED 10/22/81

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
720	.01UF		00	50V	CENTRALAB	CK-103	330701030
729	10K	1/2W	10%		AB	TYPE EB	200201036
730	10K	1/2W	10%		AB	TYPE EB	200201036
731	10K	1/2W	10%		AB	TYPE EB	200201036
732	10K	1/2W	10%		AB	TYPE EB	200201036
736	10K	1/2W	10%		AB	TYPE EB	200201036
C701	.01UF		00	50V	CENTRALAB	CK-103	330701030
C702	.12UF		10%	100V	SPRAGUE	225P12491XD3	320001240
C703	.12UF		10%	100V	SPRAGUE	225P12491XD3	320001240
C704	.015UF		10%	100V	SPRAGUE	225P15391WD3	320001530
C705	.015UF		10%	100V	SPRAGUE	225P15391WD3	320001530
C706	10UF		10%	20V	SPRAGUE	150D106X9020B2	310301060
C707	3.3PF	DA N330		1KV	CENTRALAB	DD-3R3	330003390
C708	.01UF		00	50V	CENTRALAB	CK-103	330701030
C709	510PF	DB Z5R	10%	1KV	CENTRALAB	DD-511	330005110
C710	10PF	DA N330	10%	1KV	CENTRALAB	DD-100	330001000
C711	150PF	DB N3300	10%	1KV	CENTRALAB	DD-151	330001510
C712	.0047UF		10%	100V	SPRAGUE	225P47291WD3	320004720
C713	.01UF		00	50V	CENTRALAB	CK-103	330701030
C714	.01UF		00	50V	CENTRALAB	CK-103	330701030
C715	150PF	DB N3300	10%	1KV	CENTRALAB	DD-151	330001510
C716	.01UF		00	50V	CENTRALAB	CK-103	330701030
C717	22PF	DA N330	10%	1KV	CENTRALAB	DD-220	330002200
C718	680PF	DB Z5R	10%	1KV	CENTRALAB	DD-681	330006810
C719	1000PF	DC Z5R	10%	1KV	CENTRALAB	DD-102	330001020
C721	1.0UF	ME Y5V	20%	100V	ERIE	8141-100-651-105M	330801051
CR701	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR702	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR703	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR704	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR705	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR706	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR707	DO35	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
J708	14DIP-P			TTL	TI	SN74132,	510074132
Q701-704	TO-92	350MW TA	NPN	40V	MOTOROLA	2N3903	550039030
Q705	TO92	310MW TA	P	40V	MOTOROLA	MPF152 2N5461	555001520
Q706	TO92	310MW TA	P	40V	MOTOROLA	MPF152 2N5461	555001520
Q707	TO-39	5W		300V	RCA	40327	550040327
Q708	TO-39	5W		300V	RCA	40327	550040327
Q709	TO-39	5W		300V	RCA	40327	550040327
Q710	TO-92	350MW TA	NPN	40V	MOTOROLA	2N3903	550039030
Q711	TO-39	5W		300V	RCA	40327	550040327
Q712	TO-92	350MW TA	NPN	40V	MOTOROLA	2N3903	550039030
R701	510-	1/2W	5%		AB	TYPE EB	200205115
R702	12K	1/2W	10%		AB	TYPE EB	200201236
R703	12K	1/2W	10%		AB	TYPE EB	200201236
R704	510-	1/2W	5%		AB	TYPE EB	200205115
R705	1180-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220211811

Table 6—8. DC-LOG Converter And Control Logic Parts List (Sheet 2 of 2)

N O R T H E A S T REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-029
E L E C T R O N I C S PC BRD ASSY E 95500 PAGE 2 REV 14 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
R706	1K	.25W			CTS	UPE200RE1-SR9320	231301020
R707	9760-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220297611
R708	10K	1/2W	10%		AB	TYPE EB	200201036
R709	330-	1/2W	10%		AB	TYPE EB	200203316
R710	10K	1/2W	10%		AB	TYPE EB	200201036
R711	22K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220222021
R712	47.5K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220247521
R713	100K	.25W			CTS	UPE200RE1-SW1818	231301040
R714	10K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210021
R715	20K	.25W			CTS	UPE200RE1-SQ8518	231302030
R716	470K	1/2W	10%		AB	TYPE EB	200204746
R717	22K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220222021
R718	1.5K	1/2W	10%		AB	TYPE EB	200201526
R719	10-	1/2W	10%		AB	TYPE EB	200201006
R720	12-	1/2W	5%		AB	TYPE EB	200201205
R721	100K	1/2W	10%		AB	TYPE EB	200201046
R722	10K	1/2W	10%		AB	TYPE EB	200201036
R723	100K	1/2W	10%		AB	TYPE EB	200201046
R724	20K	1/2W	5%		AB	TYPE EB	200202035
R725	3.3K	1/2W	10%		AB	TYPE EB	200203326
R726	20K	5W	5%		W LEONARD	TYPE 5XM	210402035
R727	10K	1/2W	10%		AB	TYPE EB	200201036
R728	10K	1/2W	10%		AB	TYPE EB	200201036
R733	SEL.VAL.	1/2W			AB	TYPE EB	200200000
R734	SEL.VAL.	1/2W			AB	TYPE EB	200200000
R735	100K	1/2W	10%		AB	TYPE EB	200201046
R737	100-	1/2W	10%		AB	TYPE EB	200201016
U701	14DIP-P			TTL	TI	SN7490AN	510074900
U702	14DIP-P			TTL	TI	SN7490AN	510074900
U703	14DIP-P			UTL	SIGNETICS	SF380A	510003800
U704	14DIP-P			TTL	TI	SN7472N	510074720
U705	14DIP-P			TTL	TI	SN7473N	510074730
U706	14DILP				TI	SN72709N	500007050
U707	14DILP				TI	SN72709N	500007050
XQ707	SKT				ELCO	05-3303	826600100

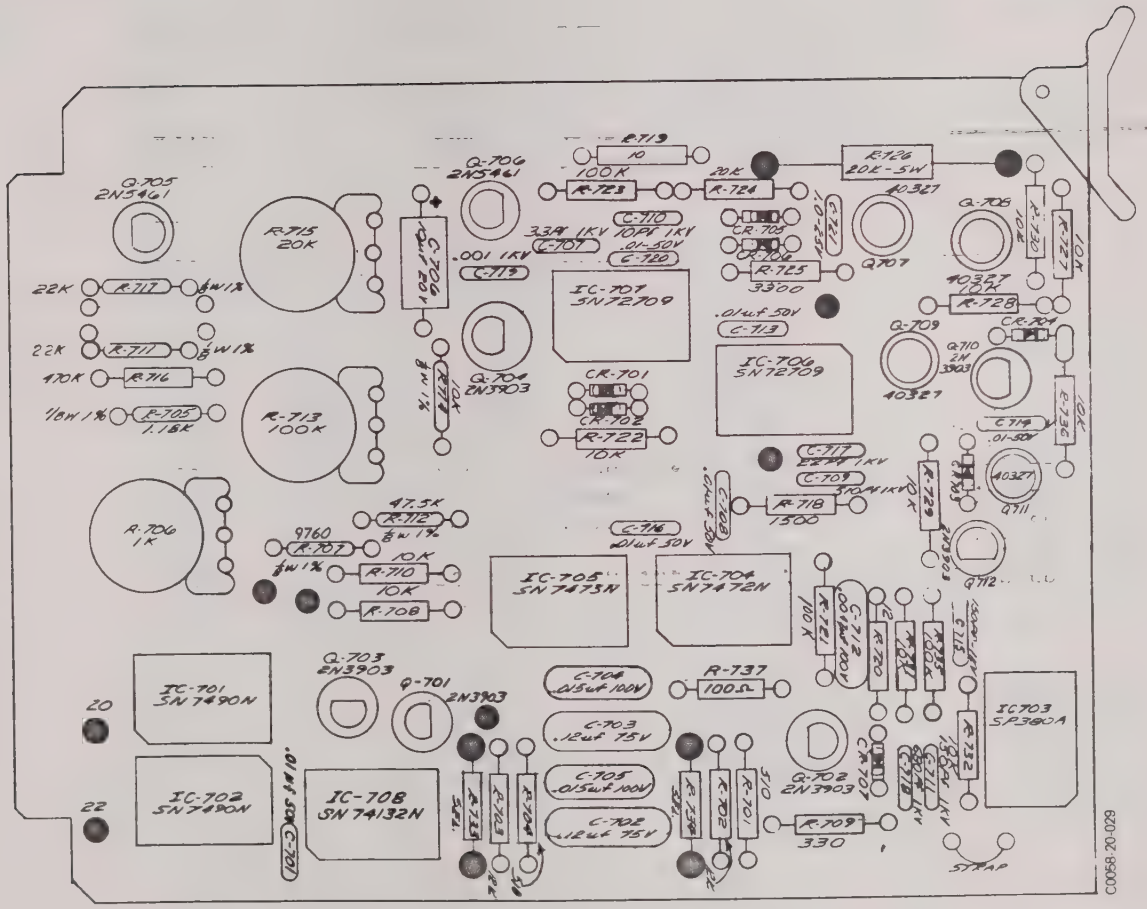


Figure 6—8. DC-LOG Converter And Control Logic Parts Location Diagram

Table 6—9. Display Driver Assembly Parts List

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-068
DISPLAY DRIVER ASSY — PAGE 1 REV 01 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	.0047UF		10%	100V	SPRAGUE	225P47251WD3	320004720
C2	.018UF		10%	100V	SPRAGUE	225P18351WD3	320001830
C3	2.2UF		10%	35V	KEMET	T330A225K035AS	310002250
C4	4.7UF		10%	25V	KEMET	T330A475K025AS	310004751
J1	12 SIP				BERG	65524-412	654003245
Q1	TO-92	350MW TA	NPN	25V	MOTOROLA	MPS6515	550065150
Q2-Q5	TO-92	350MW TA	PNP	40V	MOTOROLA	MPS6518	550065180
R1	33K	1/4W	10%		AB	TYPE CB	200103336
R2	150K	1/4W	10%		AB	TYPE CB	200101546
R3	68K	1/4W	10%		AB	TYPE CB	200106836
R4	4.7K	1/4W	10%		AB	TYPE CB	200104726
R5	4.7K	1/4W	10%		AB	TYPE CB	200104726
R6	40.2K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220240221
R7	40.2K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220240221
R8-R14	220-	1/4W	10%		AB	TYPE CB	200102216
R15-R18	1K	1/4W	10%		AB	TYPE CB	200101026
R19	10K	1/4W	10%		2	00 A410100015R71-7	200101036
R20-R23	10K	1/4W	10%		2	00 A410100015R71-7	200101036
R24	10K	1/4W	10%		2	00 A410100015R71-7	200101036
U1	14DIP-P			TTL	TI	SN74121N	510074121
U2	14DIP-P			TTL	TI	SN74121N	510074121
U3	14DIP-P			TTL	TI	SN7474N	510074740
U4	16DIP-P			TTL	TI	SN74155N	510074155
U5-U8	16DIP-P			TTL	T.I.	SN7447AN	510074470
U9	14DIP-P			TTL	TI	SN7404N	510074040
U10	14DIP-P			TTL	TI	SN7402N	510074020
VR1	A140	1W	5%	3.3V	SCHAUER	SZ3.3A	562000331

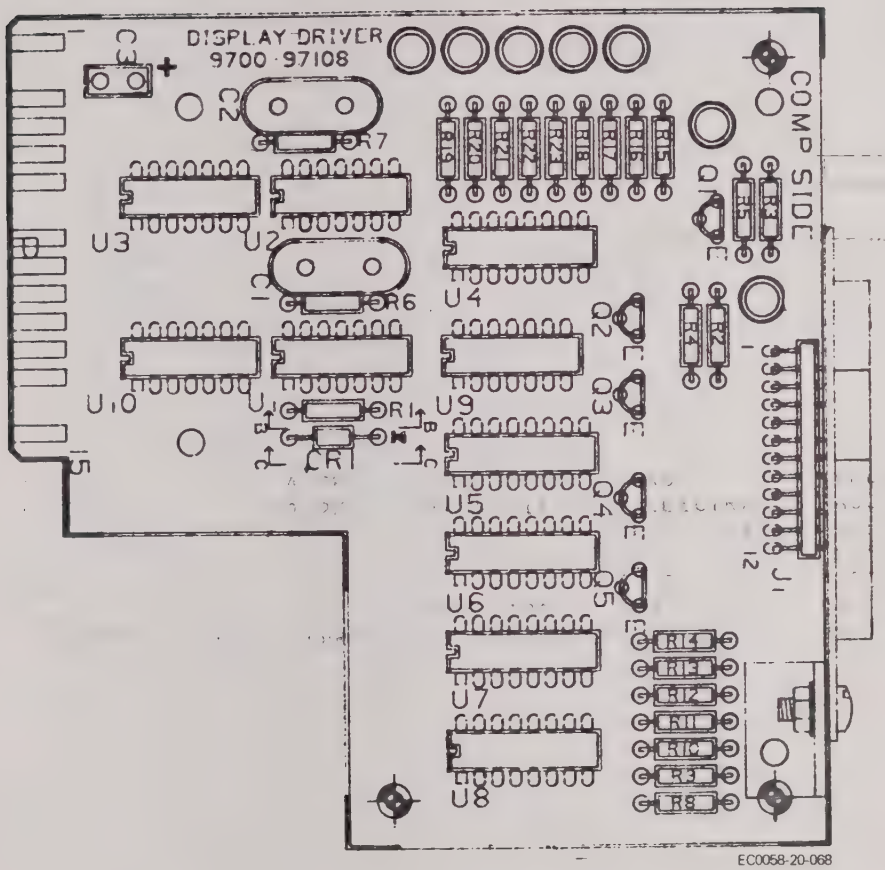


Figure 6—9. Display Driver Parts Location Diagram

Table 6—10. Display Board Assembly Parts List

N O R T H E A S T REPLACABLE PARTS LIST FOR ASSEMBLY B0058-20-069
E L E C T R O N I C S DISPLAY BD ASSY PAGE 1 REV 01 DATED 10/23/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
U11-U14	14PDIL	20MA	RED		HP	5082-7650	728301701

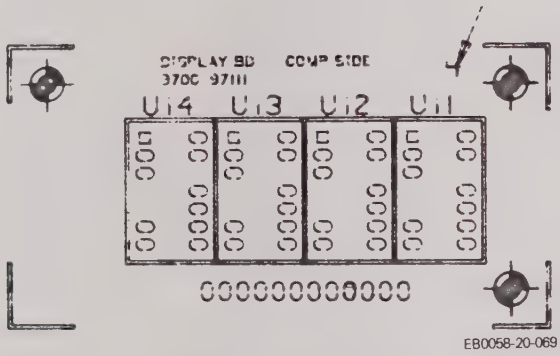


Figure 6—10. Display Board Parts Location Diagram

Table 6—11. AC-DC Converter Parts List (Sheet 1 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-031 PC BRD ASSY E-95464 — PAGE 1 REV 09 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C901	.47UF MD	Y5V	20%	100V	ERIE	8131-100-651-474M	330804741
C901	.47UF MD	Y5V	20%	100V	ERIE	8131-100-651-474M	330804741
C902	.47UF MD	Y5V	20%	100V	ERIE	8131-100-651-474M	330804741
C903	100PF DB	N3300	10%	1KV	CENTRALAB	DD-101	330001010
C904	3.3PF CA	N330		1KV	CENTRALAB	DD-3R3	330003390
C905	10UF		10%	10V	KEMET	T330A106K010AS	310001060
C906	.082UF		10%	35V	KEMET	T330A823K035AS	310008230
C907	15UF		10%	10V	KEMET	T330A156K010AS	310001560
C908	10UF		10%	10V	KEMET	T330A106K010AS	310001060
C909	56UF		10%	15V	SPRAGUE	150D566X9015R2	310305660
C910	22UF		10%	20V	SPRAGUE	150D226X9020R2	310302261
C911	100UF			16V	SPRAGUE	TE-1162	300201071
C912	10UF		10%	20V	SPRAGUE	150D106X9020B2	310301060
C913	10UF		10%	20V	SPRAGUE	150D106X9020B2	310301060
C914	10UF		10%	20V	SPRAGUE	150D106X9020B2	310301060
C915	10UF		10%	20V	SPRAGUE	150D106X9020B2	310301060
C916	2.2UF		10%	35V	KEMET	T330A225K035AS	310002250
C917	2.2UF		10%	35V	KEMET	T330A225K035AS	310002250
C918	510PF DB	Z5R	10%	1KV	CENTRALAB	DD-511	330005110
C919	22PF CA	N330	10%	1KV	CENTRALAB	DD-220	330002200
C920	.47UF MD	Y5V	20%	100V	ERIE	8131-100-651-474M	330804741
C921	.47UF MD	Y5V	20%	100V	ERIE	8131-100-651-474M	330804741
C922	15UF		10%	10V	KEMET	T330A156K010AS	310001560
C923	100UF			16V	SPRAGUE	TE-1162	300201071
C924	.47UF MD	Y5V	20%	100V	ERIE	8131-100-651-474M	330804741
C925	22UF		10%	6V	KEMET	T330A226K006AS	310002260
C926	10PF CA	N330	10%	1KV	CENTRALAB	DD-100	330001000
CR901	DO35 4NS	10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR902	DO35 4NS	10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR903	DO35 4NS	10MA	SI	50UA	FAIRCHILD	IN4148	560041480
CR904	DO35 4NS	10MA	SI	50UA	FAIRCHILD	IN4148	560041480
Q901	TO-92 350MW	TA	NPN	25V	MOTOROLA	MPS6515	550065150
Q902	TO-92 350MW	TA	NPN	25V	MOTOROLA	MPS6515	550065150
Q903	TO-92 350MW	TA	NPN	25V	MOTOROLA	MPS6515	550065150
Q904	TO-92 350MW	TA	NPN	25V	MOTOROLA	MPS6515	550065150
R901	1K	1/2W	10%		AB	TYPE EB	200201026
R902	270K	1/2W	10%		AB	TYPE EB	200202746
R903	390K	1/2W	10%		AB	TYPE EB	200203946
R904	1.5K	1/2W	10%		AB	TYPE EB	200201526
R905	1M	.25W			CTS	UPE200RE1-SS9995	231301050
R906	4.7K	1/2W	10%		AB	TYPE EB	200204726
R907	680-	1/2W	5%		AB	TYPE EB	200206815
R908	150K	1/2W	5%		AB	TYPE EB	200201545
R909	270-	1/2W	10%		AB	TYPE EB	200202716
R910	68K	1/2W	5%		AB	TYPE EB	200206835
R911	22K	1/2W	10%		AB	TYPE EB	200202236
R912	1K	1/2W	10%		AB	TYPE EB	200201026
R913	1.2K	1/2W	10%		AB	TYPE EB	200201226
R914	1K	1/2W	10%		AB	TYPE EB	200201026
R915	1K	1/2W	10%		AB	TYPE EB	200201026

Table 6—11. AC-DC Converter Parts List (Sheet 2 of 2)

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY C0058-20-031
PC BRD ASSY E 55464· PAGE 2 REV 09 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
R916	2.2K	1/2W	5%		AB	TYPE EB	200202225
R917	390-	1/2W	10%		AB	TYPE EB	200203916
R918	10K	1/2W	10%		AB	TYPE EB	200201036
R919	100K	1/2W	10%		AB	TYPE EB	200201046
R920	100K	1/2W	10%		AB	TYPE EB	200201046
R921	3480-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220234811
R922	3480-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220234811
R923	390-	1/2W	10%		AB	TYPE EB	200203916
R924	10K	1/2W	10%		AB	TYPE EB	200201036
R925	47K	1/2W	10%		AB	TYPE EB	200204736
R926	47K	1/2W	10%		AB	TYPE EB	200204736
R927	4120-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220241211
R928	100K	1/2W	10%		AB	TYPE EB	200201046
R929	500K	.25W			CTS	UPE200RE1-SR9318	231305040
R930	150K	1/2W	5%		AB	TYPE EB	200201545
R931	1.5K	1/2W	10%		AB	TYPE EB	200201526
R932	51-	1/2W	5%		AB	TYPE EB	200205105
R933	4.7K	1/2W	10%		AB	TYPE EB	200204726
R934	1.8K	1/2W	5%		AB	TYPE EB	200201825
R935	56-	1/2W	5%		AB	TYPE EB	200205605
R936	82K	1/2W	5%		AB	TYPE EB	200208235
R910A	SEL.VAL.	1/2W			AB	TYPE EB	200200000
R927A	33K	1/2W	5%		AB	TYPE EB	200203335
U901	14DILP				TI	SN72709N	500007090
U902	14DILP				TI	SN72709N	500007090

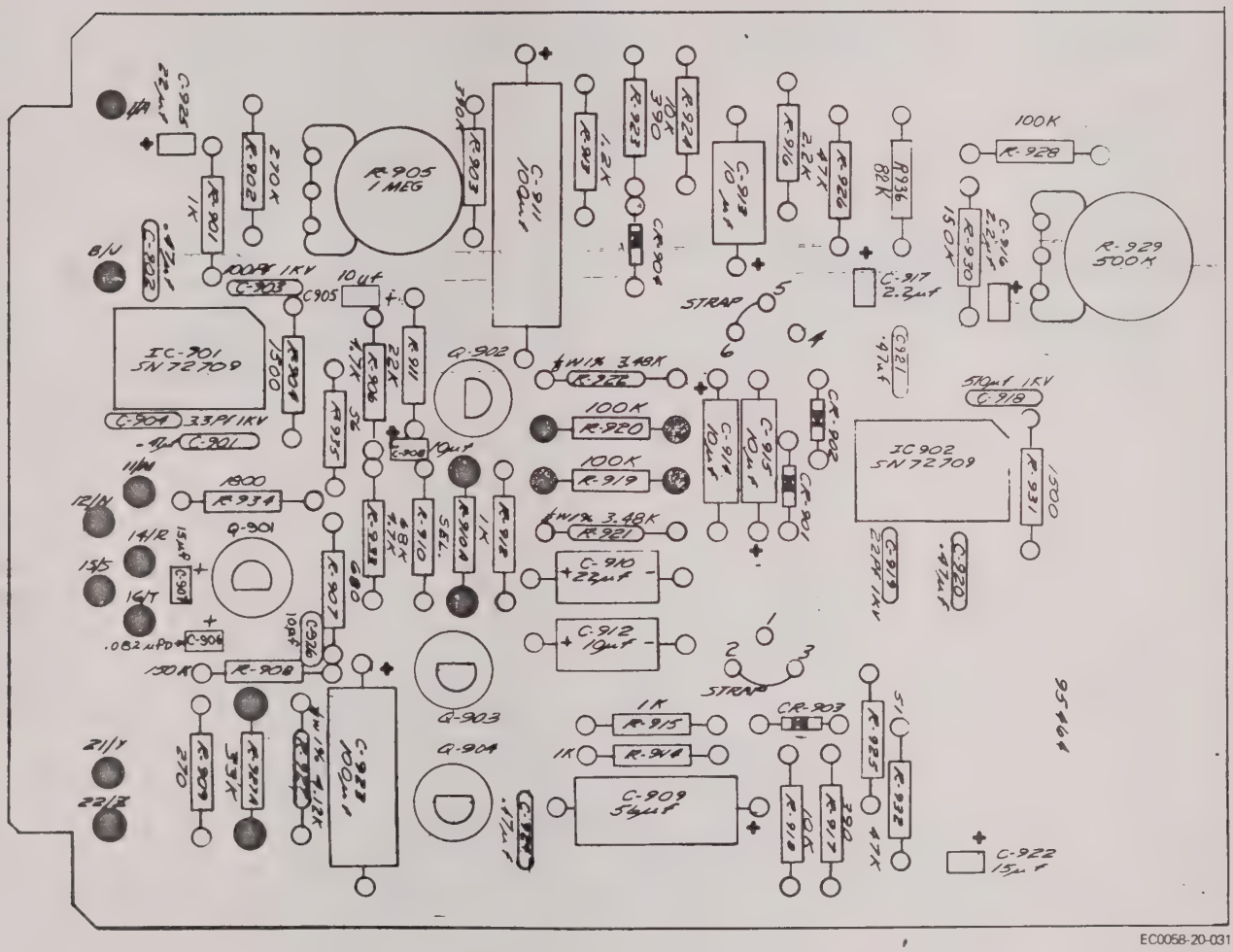


Figure 6—11. AC-DC Converter Parts Location Diagram

Table 6—12. Reset And Inhibit Location Parts List

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY B0058-20-032
PC10 E-95498 PC BD — PAGE 1 REV 06 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
C1001	.47UF		10%	100V	SPRAGUE	225P47491XD3	320004740
C1002	.1UF		10%	100V	SPRAGUE	225P10491WD3	320001040
C1003	.001UF		10%	100V	SPRAGUE	225P10291WD3	320001020
CR1001	D035	4NS 10MA	SI	50UA	FAIRCHILD	IN4148	560041480
Q1001	TO-92	350MW TA	NPN	25V	MOTOROLA	MPS6515	550065150
R1001-1004	5.6K	1/4W	10%		AB	TYPE CB	200105626
R1005	10K	1/4W	10%		2	00 A410100015R71-7	200101036
R1006	10K	1/4W	10%		2	00 A410100015R71-7	200101036
R1007	10K	1/4W	10%		2	00 A410100015R71-7	200101036
R1008	10K	1/4W	10%		2	00 A410100015R71-7	200101036
R1009	560-	1/4W	10%		AB	TYPE CB	200105616
R1010	2.7K	1/4W	10%		AB	TYPE CB	200102726
U1001	14DIP-P			UTL	SIGNETICS	SP380A	510003800

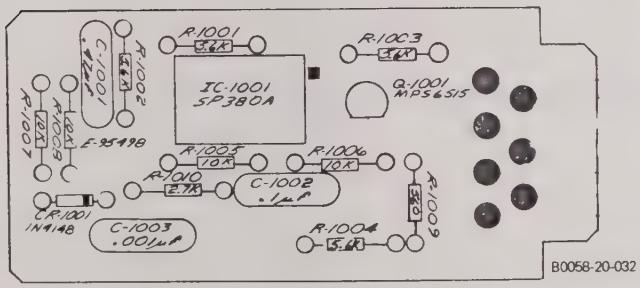


Figure 6—12. Reset And Inhibit Location Parts Location Diagram

Table 6—13. Line Noise Filter Parts List

NORTHEAST ELECTRONICS — REPLACABLE PARTS LIST FOR ASSEMBLY A0058-20-034
PC BRD ASSY E 95284 — PAGE 1 REV 07 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
C1201	470PF	DB	Z5F	10% 1KV	CENTRALAB	DD-471	330004710
C1202	470PF	DB	Z5F	10% 1KV	CENTRALAB	DD-471	330004710
J14	3-PIN MALE RECEPT-GND				SWCRFT	AC3G	652300100
L1201	100UH				MILLER	9350-08	450300500
L1202	100UH				MILLER	9350-08	450300500

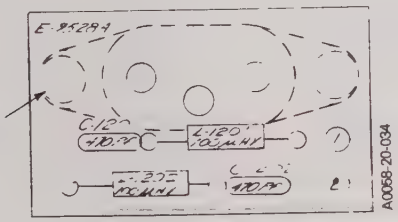


Figure 6—13. Line Noise Filter Parts Location Diagram

Table 6—14. Model 58B-CN Parts List

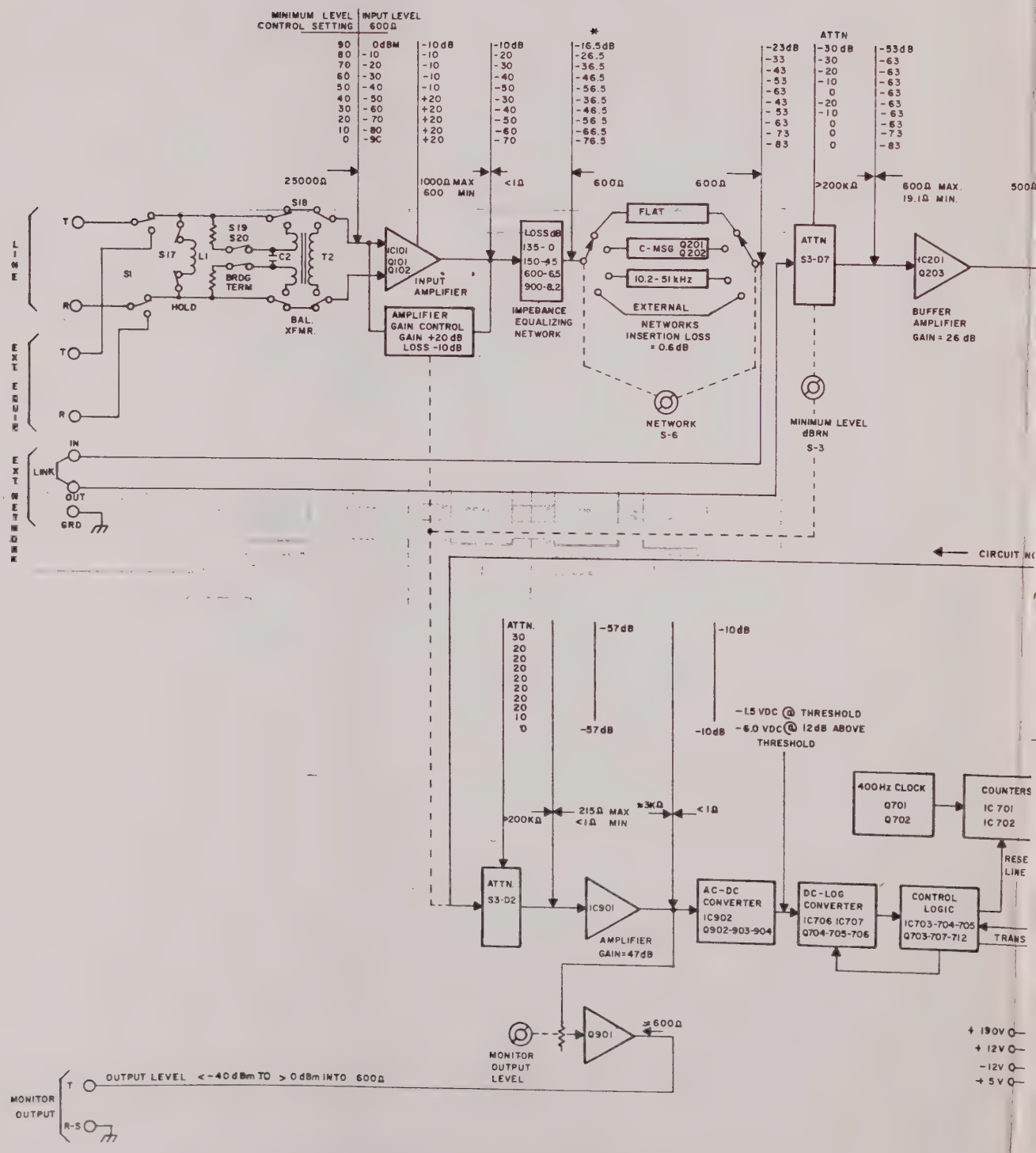
N O R T H E A S T REPLACABLE PARTS LIST FOR ASSEMBLY A0058-20-000
E L E C T R O N I C S 58B-CN O/A ASSY PAGE 1 REV 01 DATED 10/22/80

REFERENCE DESIGNATOR	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR.	MFGR. PART NO.	N.E. PART NO.
C5	.47UF MD		Y5V	20% 100V	ERIE	8131-100-651-474M	330804741
C7	.01UF DF		Z5U	GMV `1KV	CENTRALAB	DD-103	330101030
DS2	WHITE LENS				DRAKE	HR118T-603W	828200109
J9	BINDING POST METAL GND				H H SMITH	137SP	652500100
J10-11	BINDING POST-RED				GRAYHILL	29-1R	652400400
J12	BINDING POST-BLK				GRAYHILL	29-1B	652400300
J13	JACK,TEL,SWCRFT SCHEM 4				SWCRFT	12B	650101000
J25	8 -PIN DUAL READOUT				AMP	582140-5	651900500
PC2	PC BRD ASSY E 95510						A005820024
PC3	PC BRD ASSY E 95501						A005820025
PC4	PC4 CHANNEL B-C-D						A005820026
PC5	PC BRD ASSY E 95502						A005820027
PC7	PC BRD ASSY E 95500						A005820029
PC9	PC BRD ASSY E 95464						A005820031
PC13	ASSEMBLY PC 13 96056						A005820051
R1	10K	.5W			CRL	BA401-631	232901030
R2	10K	2W	10%		OHMITE	CU-1031	232001030
R27	1K	1/4W	10%		AB	TYPE CB	200101026
S8	TIMER 60-MIN TTS58A				RHODES	71002-J	961200100
S10-11	3A,300W			125V	SWCRFT	41203	630600100

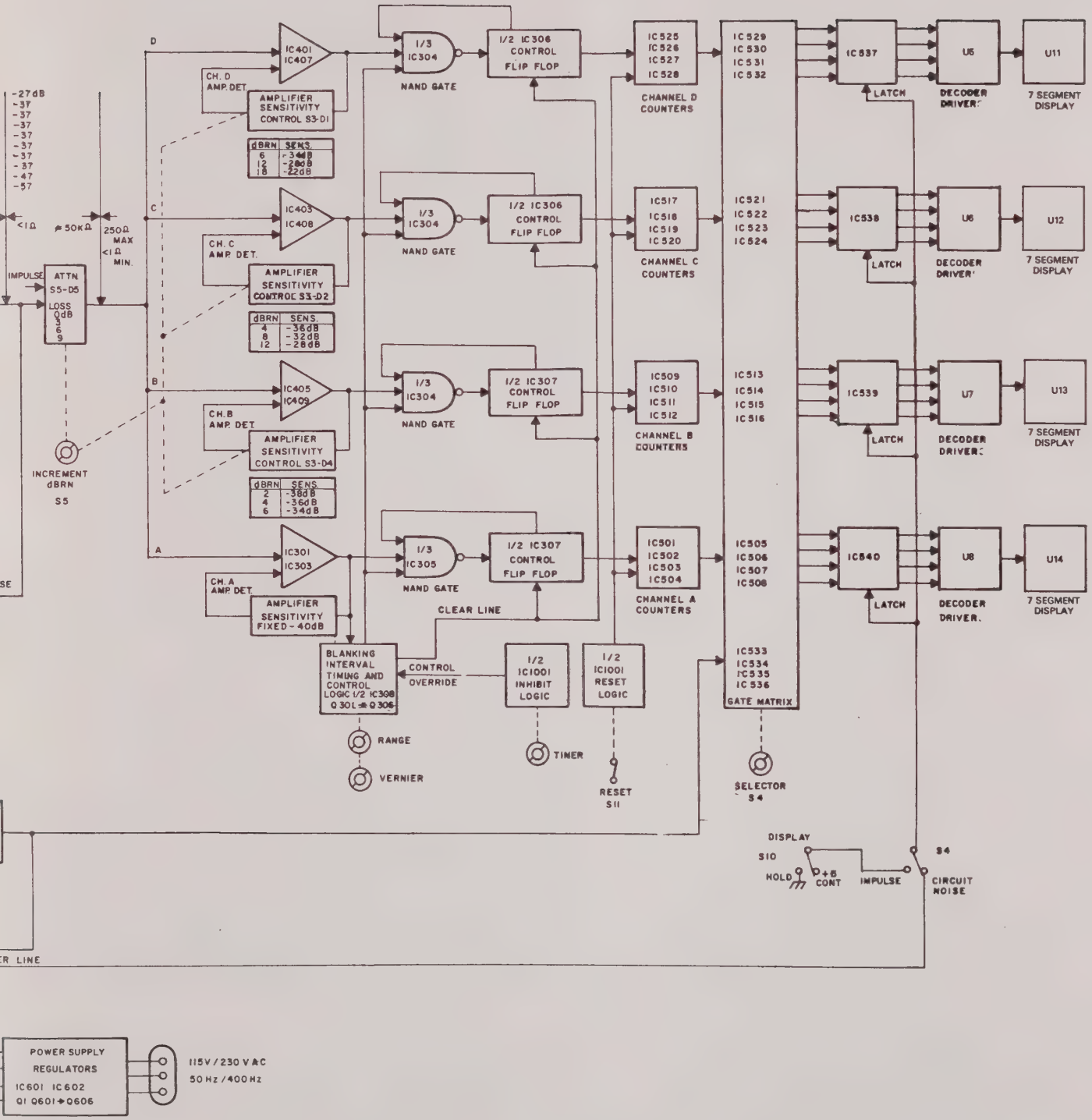
SECTION 7

SCHEMATIC DIAGRAMS

7.1 The following pages contain the schematic diagrams for the Model 58B.

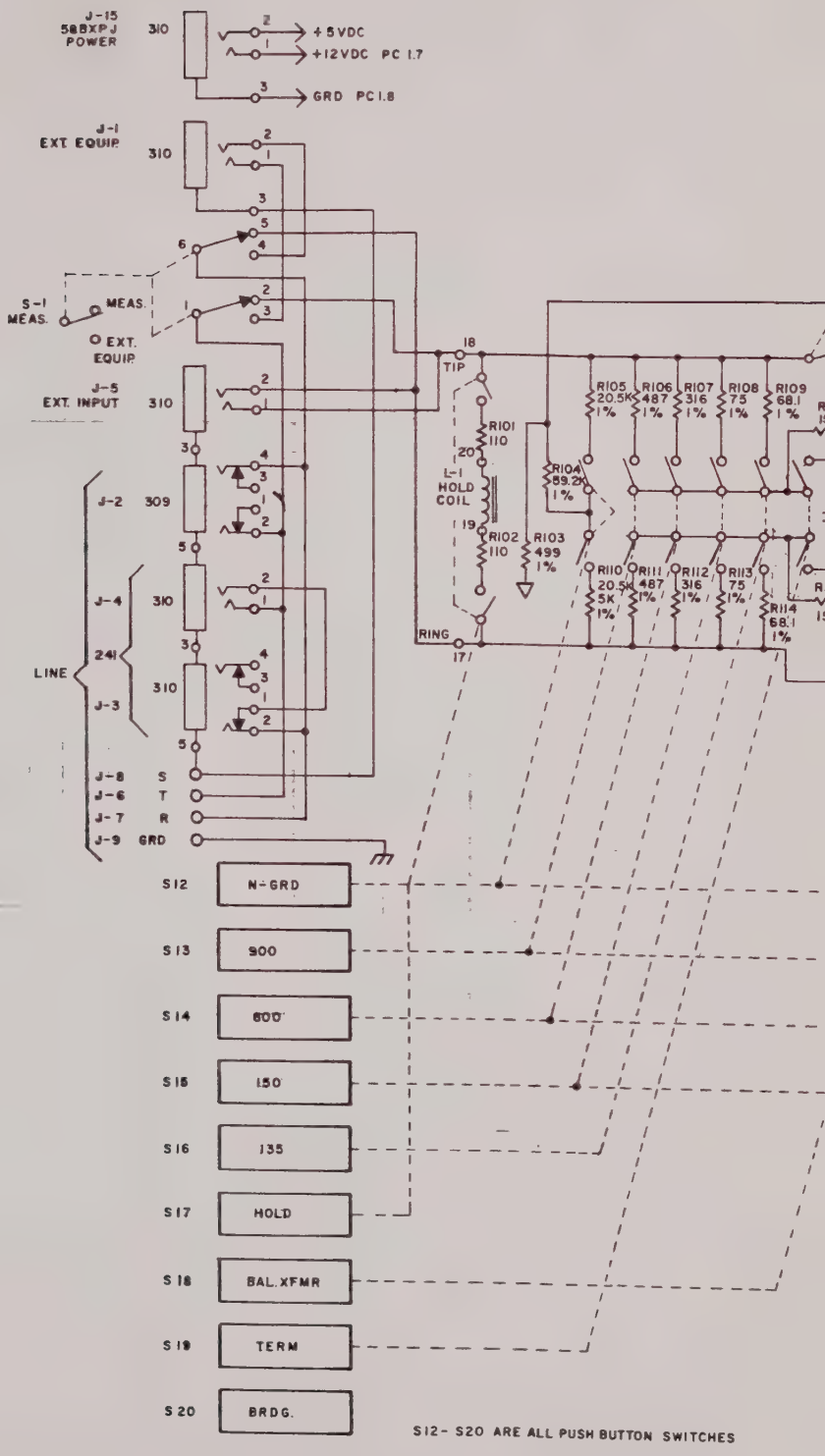


* DISCONNECTED FROM THE WEIGHTING NETWORKS



ED0058-20-303

Figure 7—1. Model 58B Block Diagram


J-15
588XPJ
POWER
310
+5VDC
+12VDC PC 1.7
GRD PC 1.8
J-1
EXT EQUIP
310
S-1
MEAS.
MEAS.
EXT.
EQUIP
J-5
EXT. INPUT
310
J-2
309
J-4
310
241
LINE
J-3
310
J-8 S
J-6 T
J-7 R
J-9 GRD
18
TIP
RING
17
L-1
HOLD
COIL
20
19
R101
110
R102
110
R103
499
1%
R104
89.2K
1%
R105
20.5K
1%
R106
487
1%
R107
316
1%
R108
75
1%
R109
68.1
1%
R110
20.5K
1%
R111
487
1%
R112
316
1%
R113
75
1%
R114
68.1
1%
S12
N-GRD
S13
900
S14
600
S15
150
S16
135
S17
HOLD
S18
BAL. XFMR
S19
TERM
S20
BRDG.
S12- S20 ARE ALL PUSH BUTTON SWITCHES

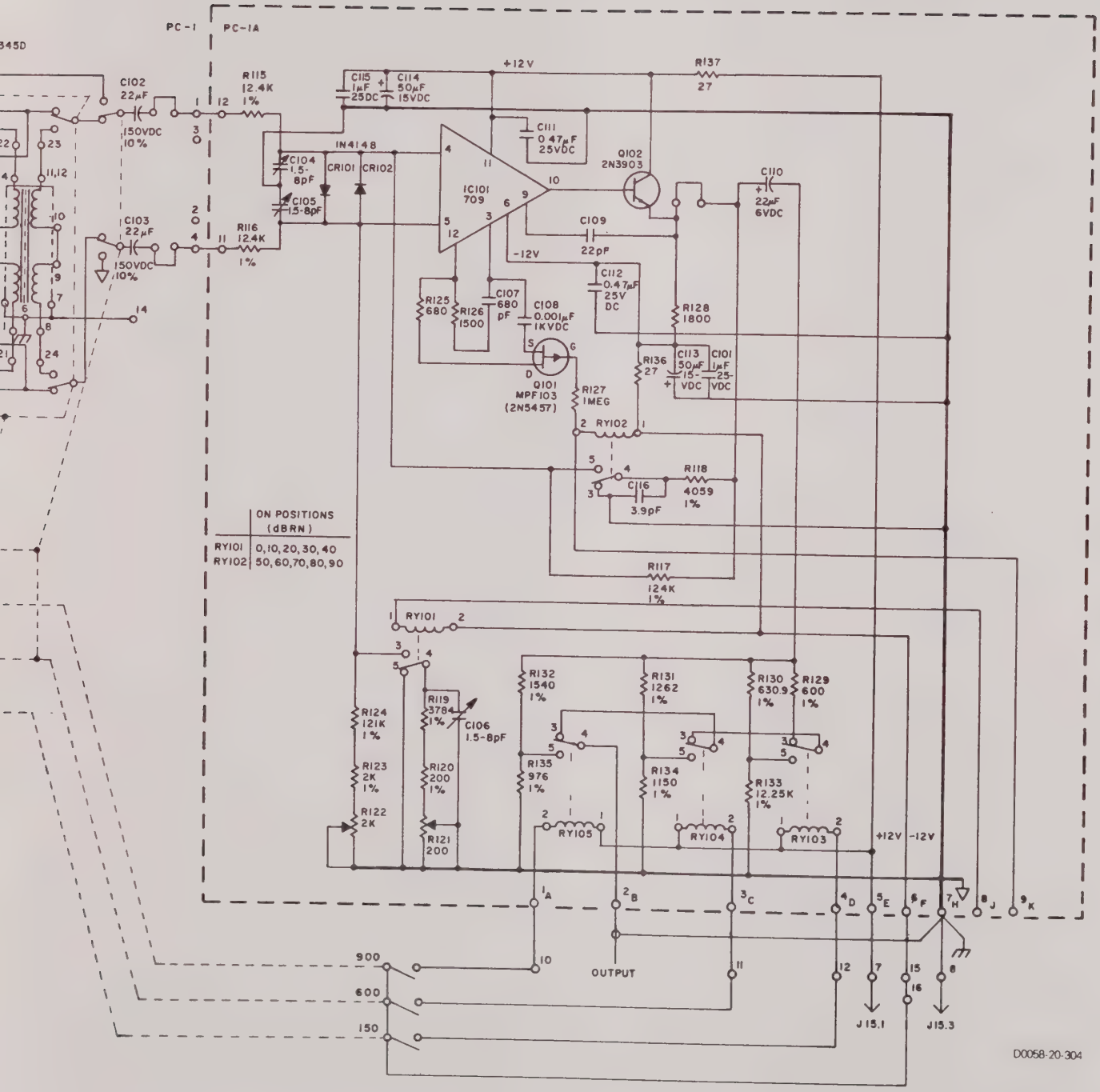
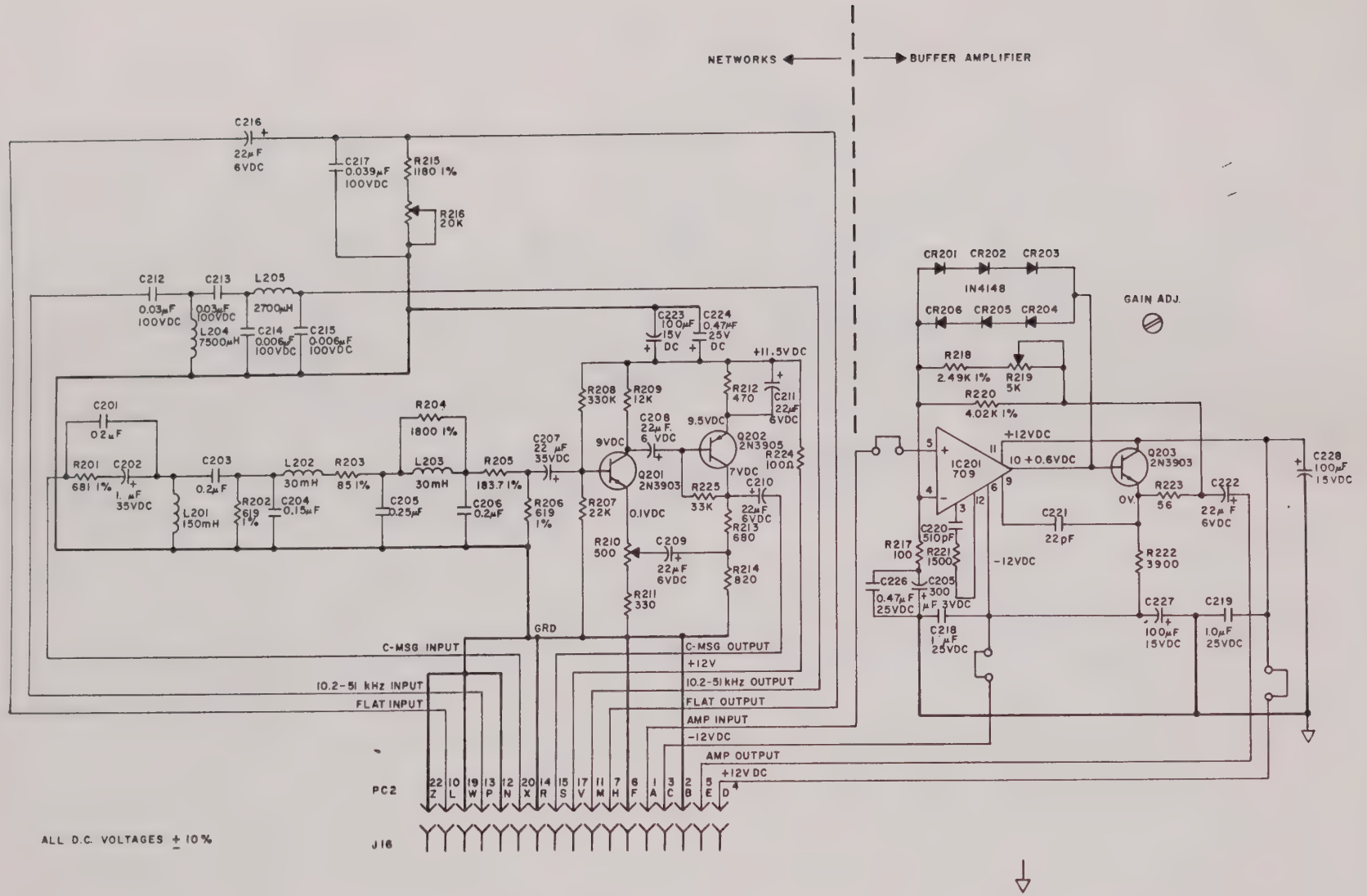


Figure 7—2. Input Circuit And Impedance (E95551) And Input Amplifier (E95552) Schematic Diagram



A02411 00

Figure 7—3. Buffer Amplifier (E95510) Schematic Diagram

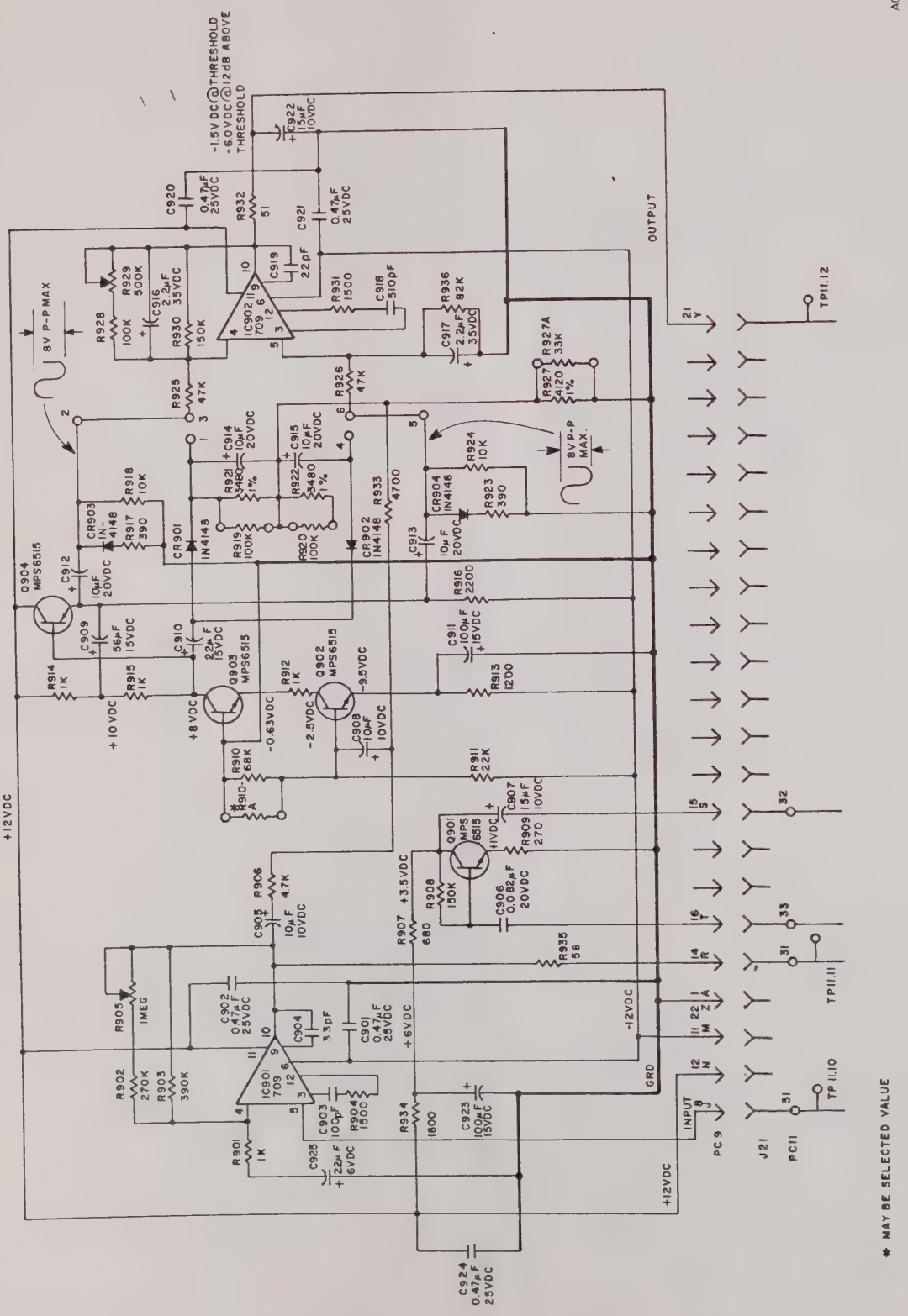
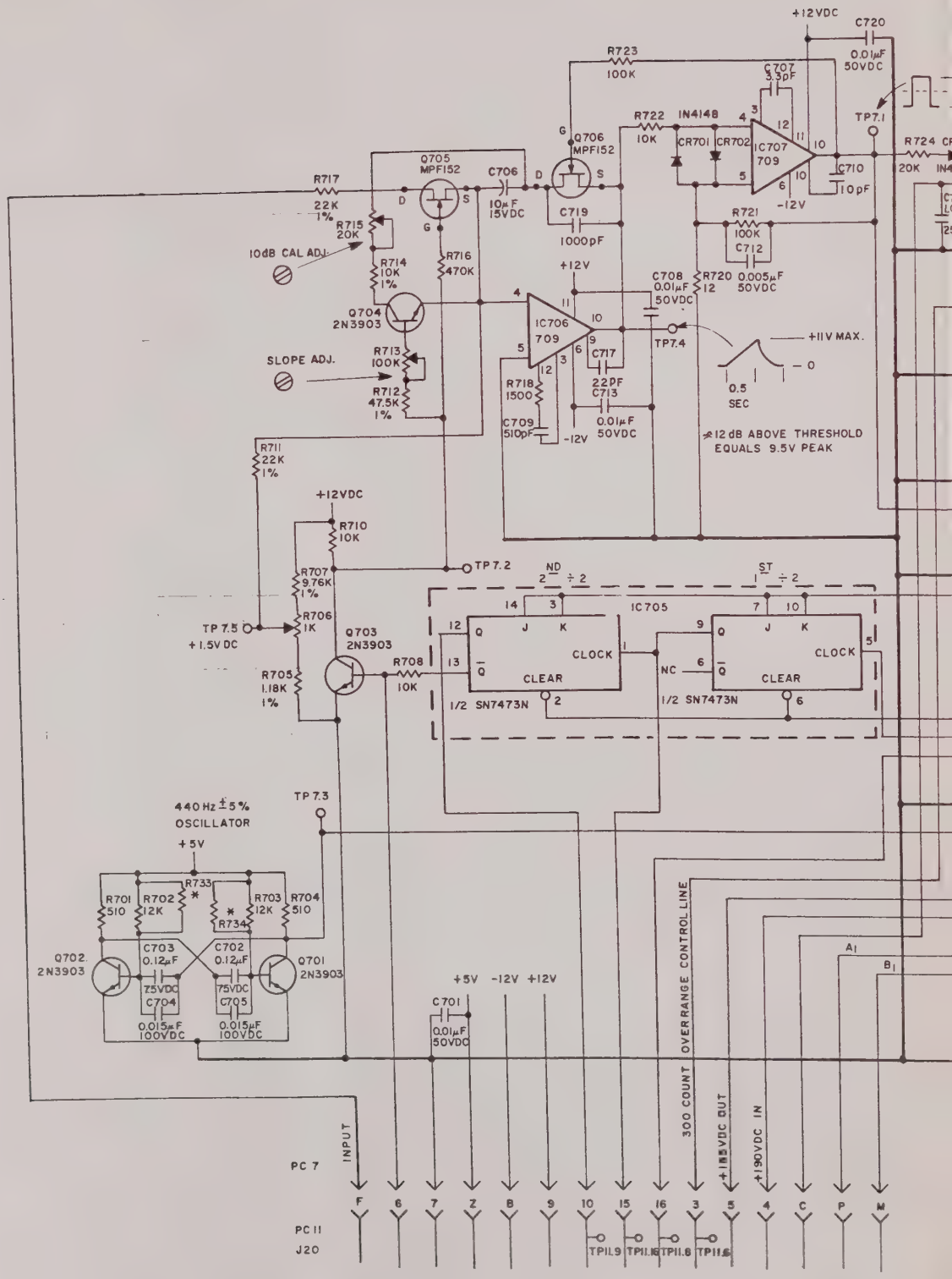
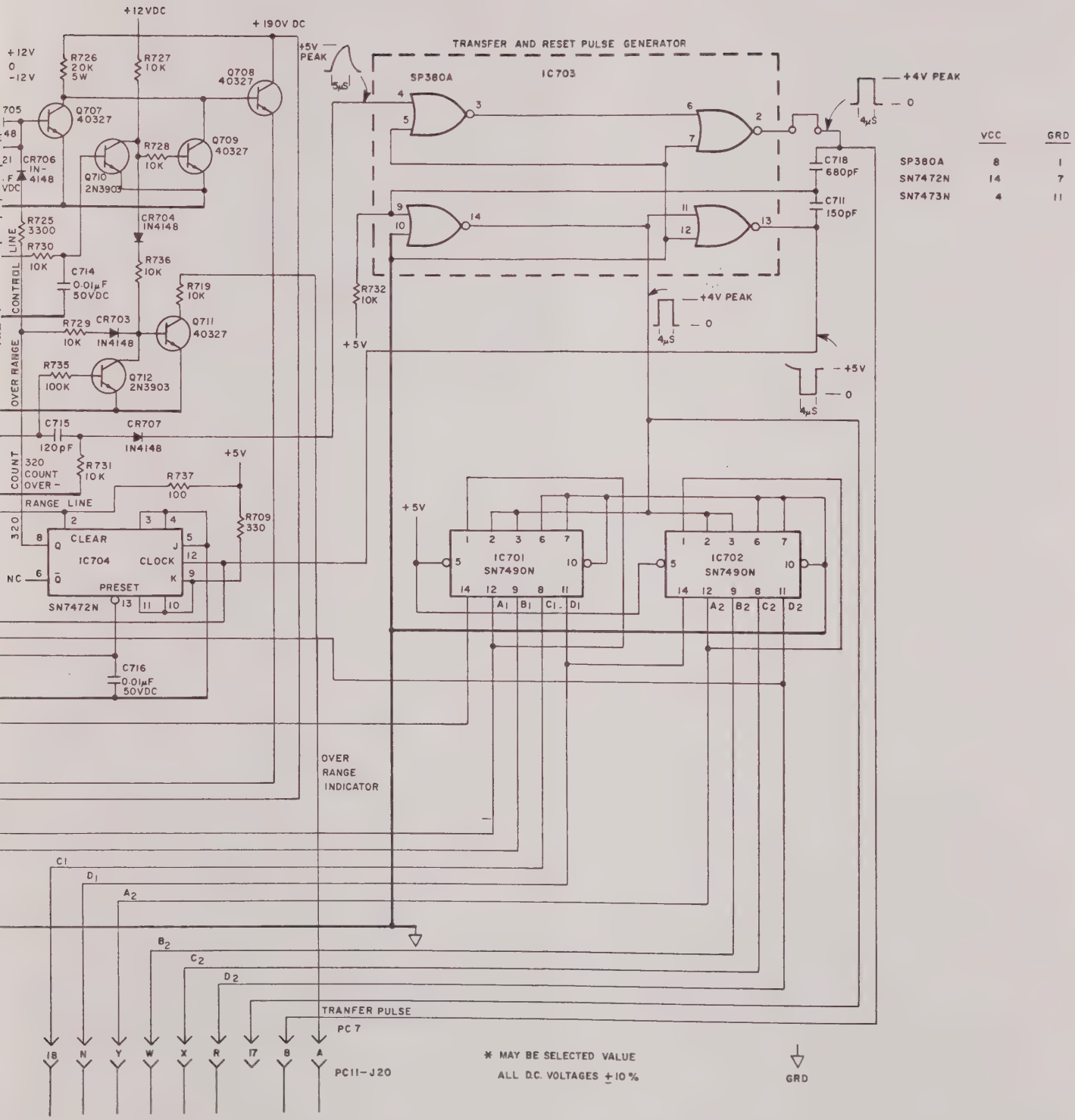


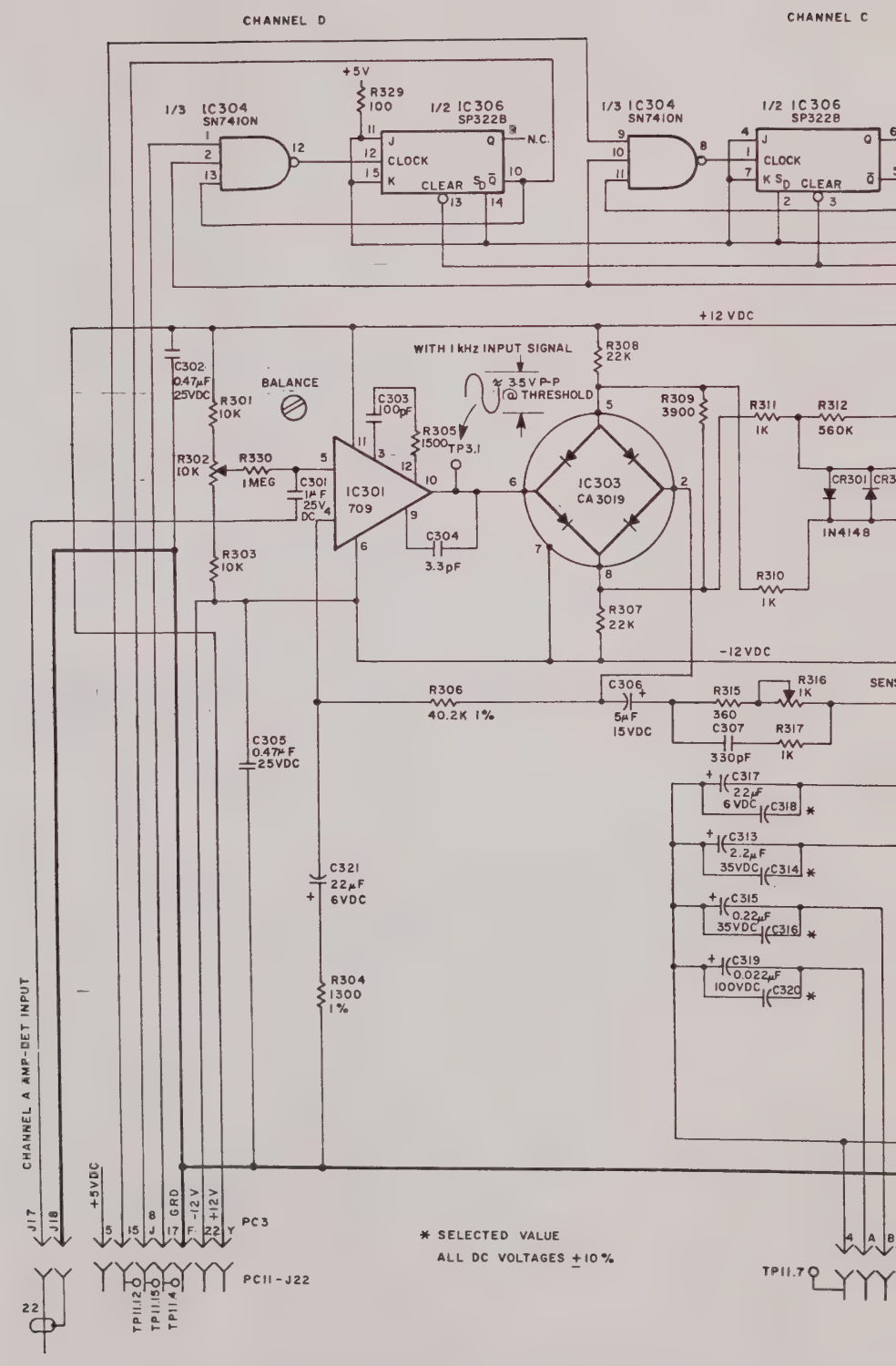
Figure 7–4. AC To DC Converter (E95464) Schematic Diagram


+12VDC
C720
0.01μF 50VDC
R723
100K
C707
3.3pF
R722
10K
IN4148
CR701
CR702
IC707
709
TP7.1
Q706
MPF152
C710
10pF
-12V
R724
20K
Q705
MPF152
C706
10μF 15VDC
R717
22K 1%
R715
20K
10dB CAL ADJ.
R714
10K 1%
R716
470K
C719
1000pF
R721
100K
C712
Q704
2N3903
+12V
C708
0.01μF 50VDC
R720
12
0.005μF 50VDC
IC706
709
TP7.4
+11V MAX.
0
0.5 SEC
SLOPE ADJ.
R713
100K
R712
47.5K 1%
C717
22pF
C713
0.01μF 50VDC
R718
1500
C709
510pF
-12V
≈12 dB ABOVE THRESHOLD EQUALS 9.5V PEAK
R711
22K 1%
+12VDC
R710
10K
TP7.2
R707
9.76K 1%
R706
1K
TP7.5
+1.5V DC
Q703
2N3903
R708
10K
R705
1.18K 1%
2ND ÷2
1ST ÷2
IC705
CLOCK
CLEAR
NC
1/2 SN7473N
1/2 SN7473N
440Hz ±5%
OSCILLATOR
TP7.3
+5V
R733
R734
R701
510
R702
12K
R703
12K
R704
510
Q702
2N3903
Q701
2N3903
C703
0.12μF
C702
0.12μF
75VDC
C704
0.015μF 100VDC
C705
0.015μF 100VDC
C701
0.01μF 50VDC
+5V -12V +12V
OVERRANGE CONTROL LINE
300 COUNT
+11.85VDC OUT
+190VDC IN
A1
B1
PC 7
INPUT
PC 11
J20
F
6
7
Z
8
9
10
15
16
3
5
4
C
P
M
TP11.9
TP11.8
TP11.6
TP11.5



B02412-00

Figure 7—5. DC To LOG Converter And Control Logic (E95500) Schematic Diagram


CHANNEL D
CHANNEL C
+5V
R329
100
1/3 IC304
SN7410N
1/2 IC306
SP322B
CLOCK
CLEAR
N.C.
+12 VDC
WITH 1 kHz INPUT SIGNAL
3.5 V P-P
@ THRESHOLD
C302
0.47μF
25VDC
BALANCE
R301
10K
R302
10K
R330
1MEG
C301
1μF
25V
DC
C303
100pF
R305
1500
TP3.1
IC301
709
C304
3.3pF
R303
10K
R308
22K
R309
3900
IC303
CA3019
R311
1K
R312
560K
CR301
CR3
IN4148
R310
1K
R307
22K
-12VDC
R306
40.2K 1%
C306
5μF
15VDC
R315
360
R316
1K
C307
330pF
R317
1K
C305
0.47μF
25VDC
C317
2.2μF
6VDC
C318
C313
2.2μF
35VDC
C314
C315
0.22μF
35VDC
C316
C319
0.022μF
100VDC
C320
C321
22μF
6VDC
R304
1300
1%
CHANNEL A AMP-DET INPUT
J17
J18
+5VDC
GRD
-12V
+12V
PC3
PC11-J22
TP11.2
TP11.5
TP11.4
TP11.7
* SELECTED VALUE
ALL DC VOLTAGES ±10%

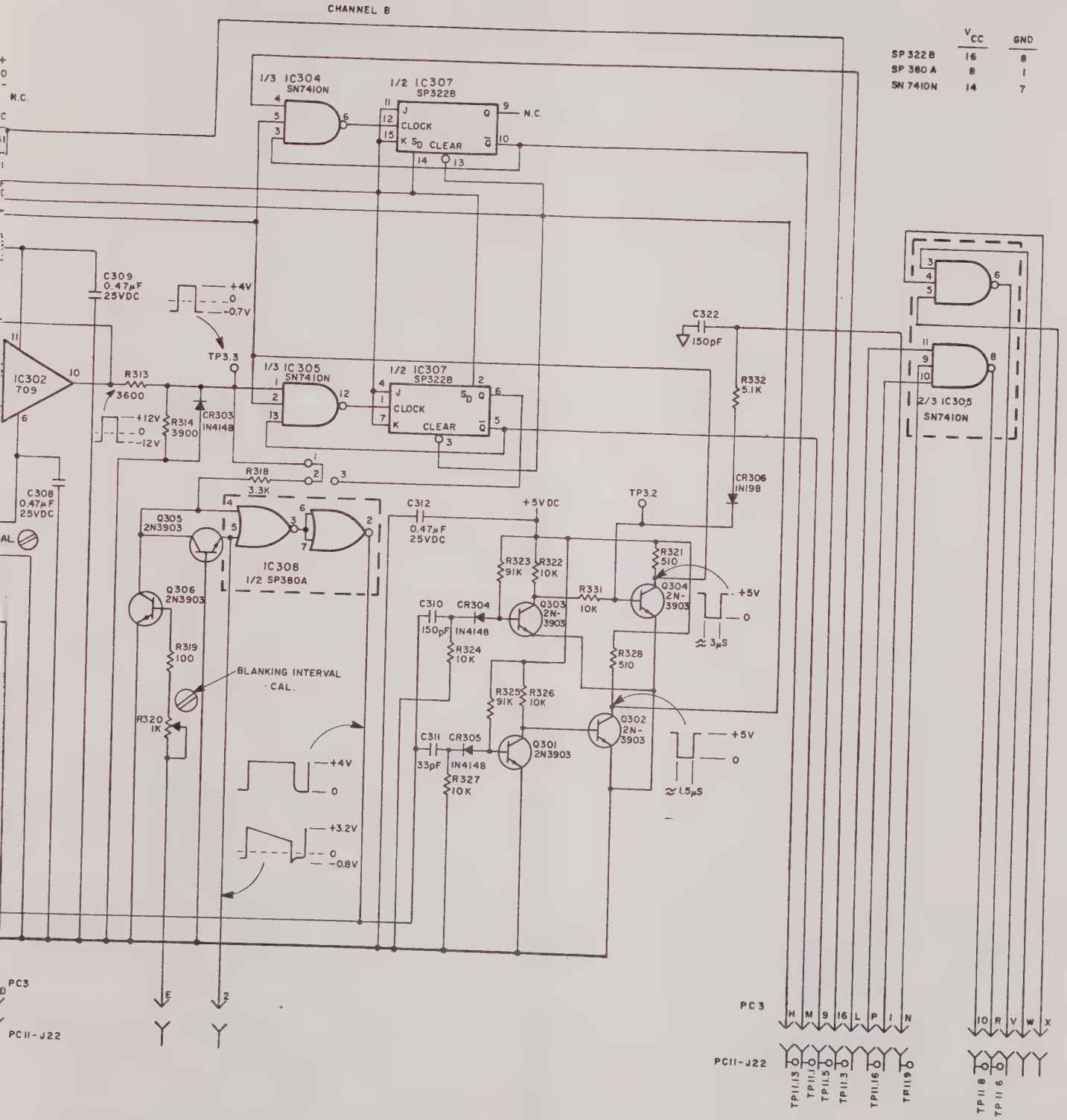
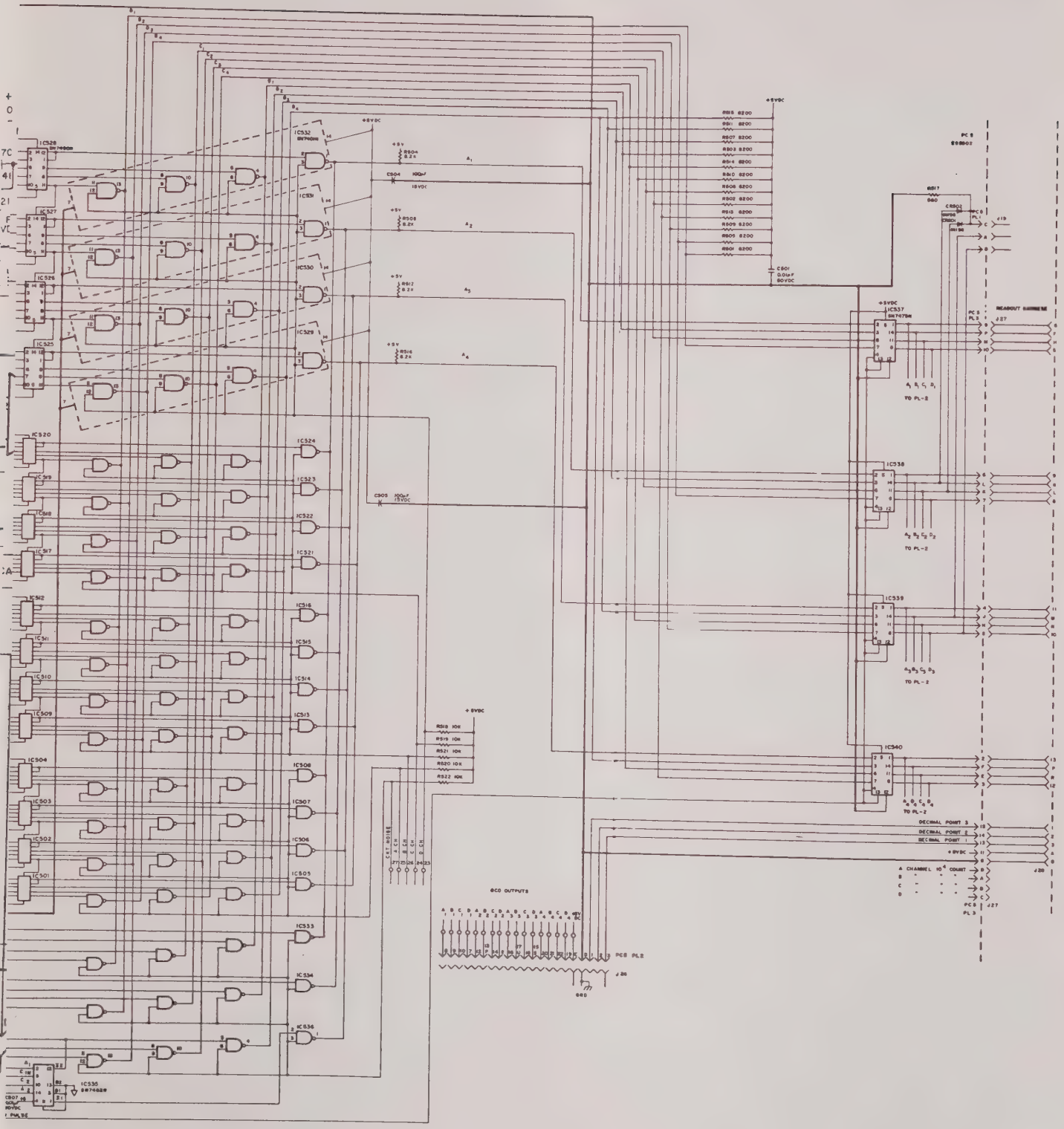


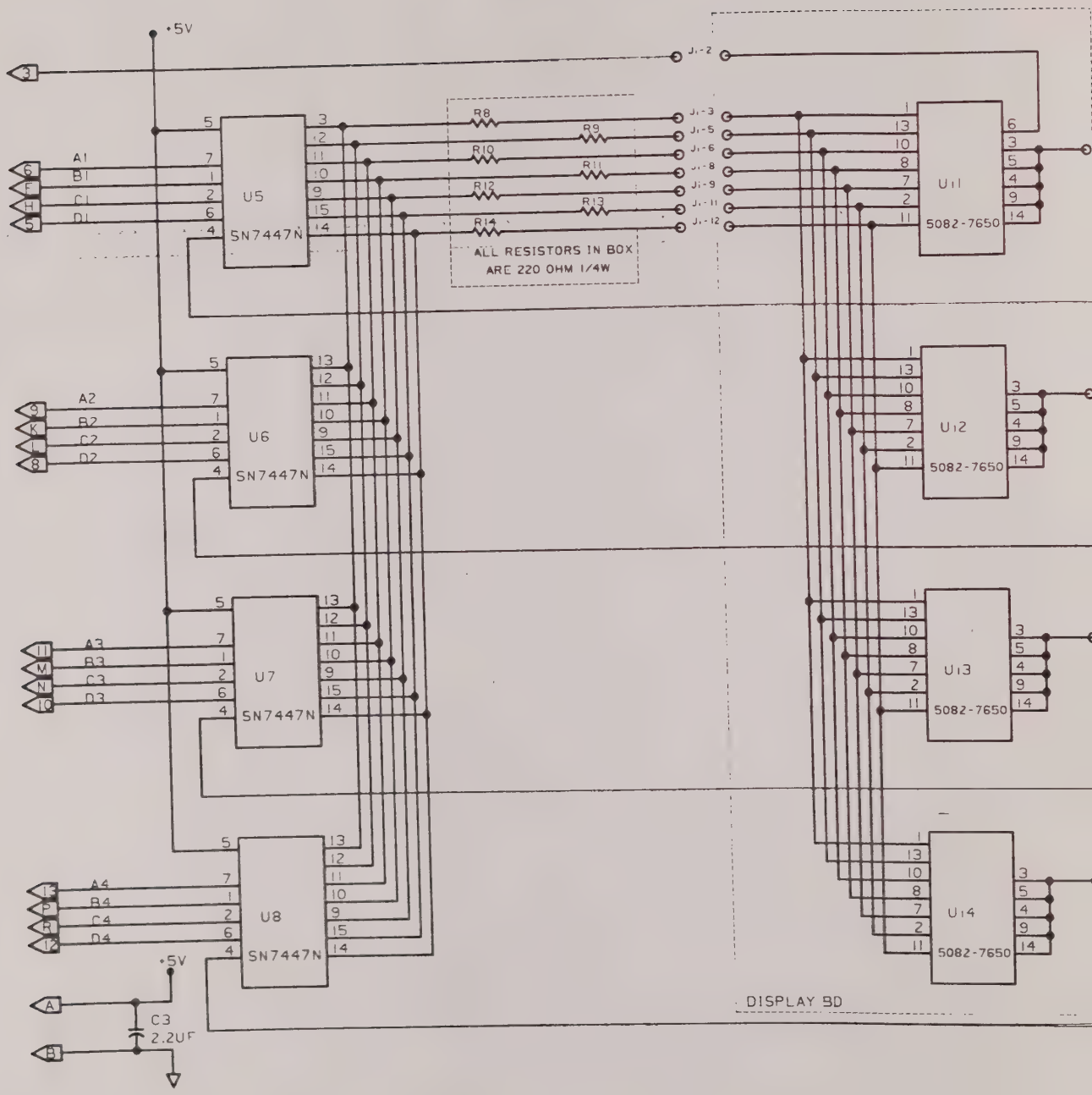
Figure 7—6. Channel A And Inhibit Circuit (E95501) Schematic Diagram

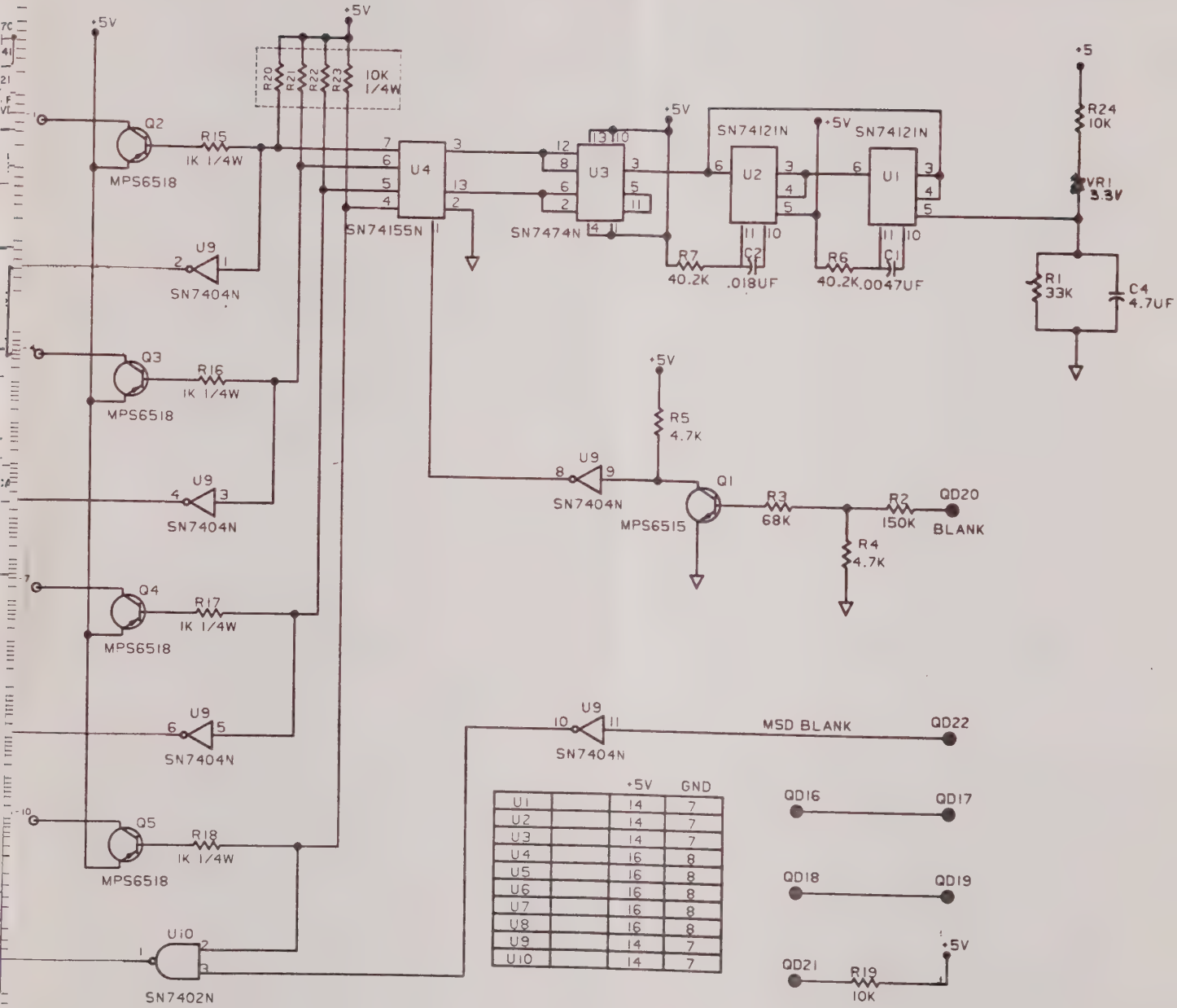
B CHANNEL
GATE MATRIX FOR CHANNELS A, B, AND C SAME CONFIGURATION AS SHOWN FOR CHANNEL D
C CHANNEL
B CHANNEL
A CHANNEL
CIRCUIT NOISE



B02419 00

Figure 7—8. Counter And Gate Matrix (E95502) Schematic Diagram

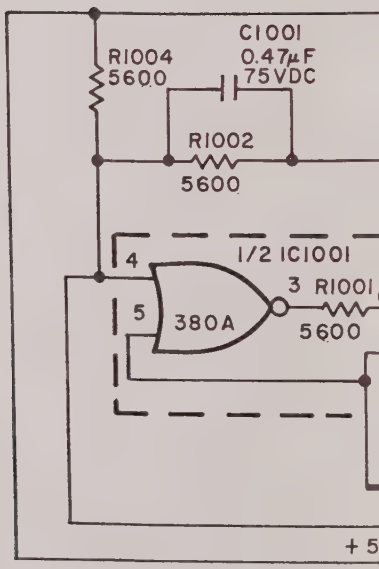

+5V
U5
SN7447N
U6
SN7447N
U7
SN7447N
U8
SN7447N
A1
B1
C1
D1
A2
B2
C2
D2
A3
B3
C3
D3
A4
B4
C4
D4
R8
R9
R10
R11
R12
R13
R14
ALL RESISTORS IN BOX
ARE 220 OHM 1/4W
U11
U12
U13
U14
5082-7650
C3
2.2UF
DISPLAY BD



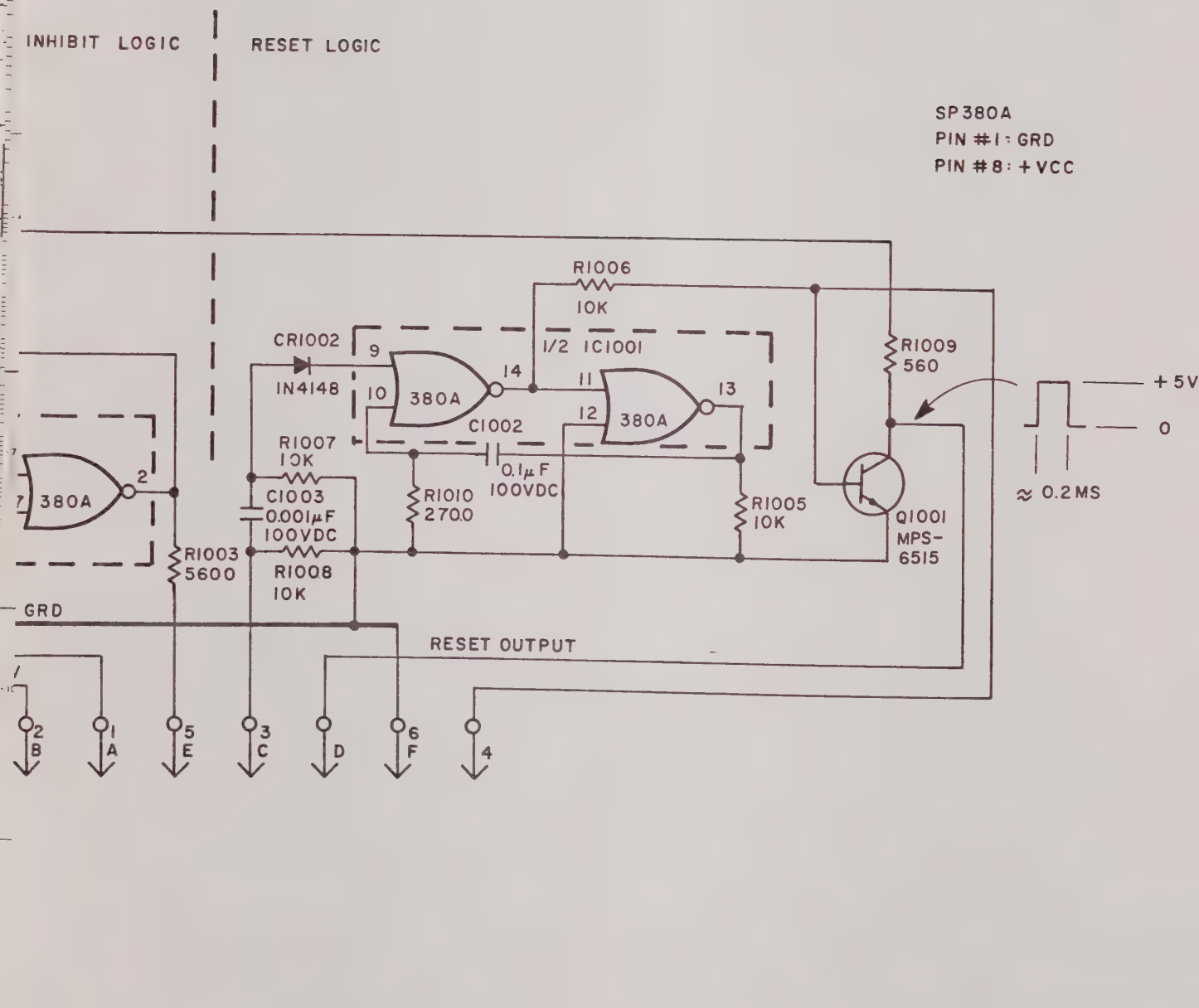
	+5V	GND
U1	14	7
U2	14	7
U3	14	7
U4	16	8
U5	16	8
U6	16	8
U7	16	8
U8	16	8
U9	14	7
U10	14	7

D0058 20 368

Figure 7—9. Display Driver (E97108) Schematic Diagram

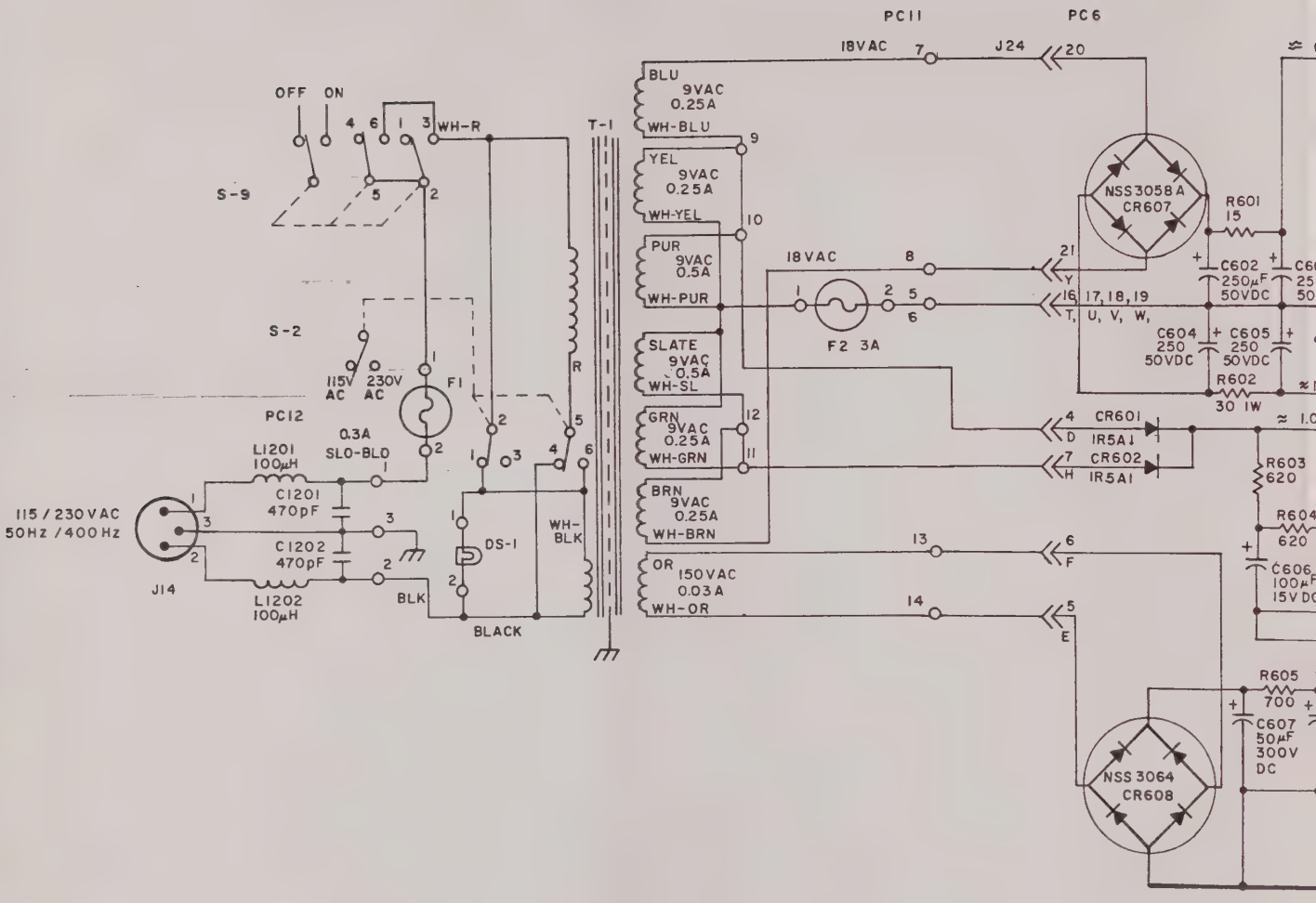

C1001
0.47μF
75VDC
R1004
560Ω
R1002
560Ω
1/2 IC1001
4
5
380A
3 R1001
560Ω
+5

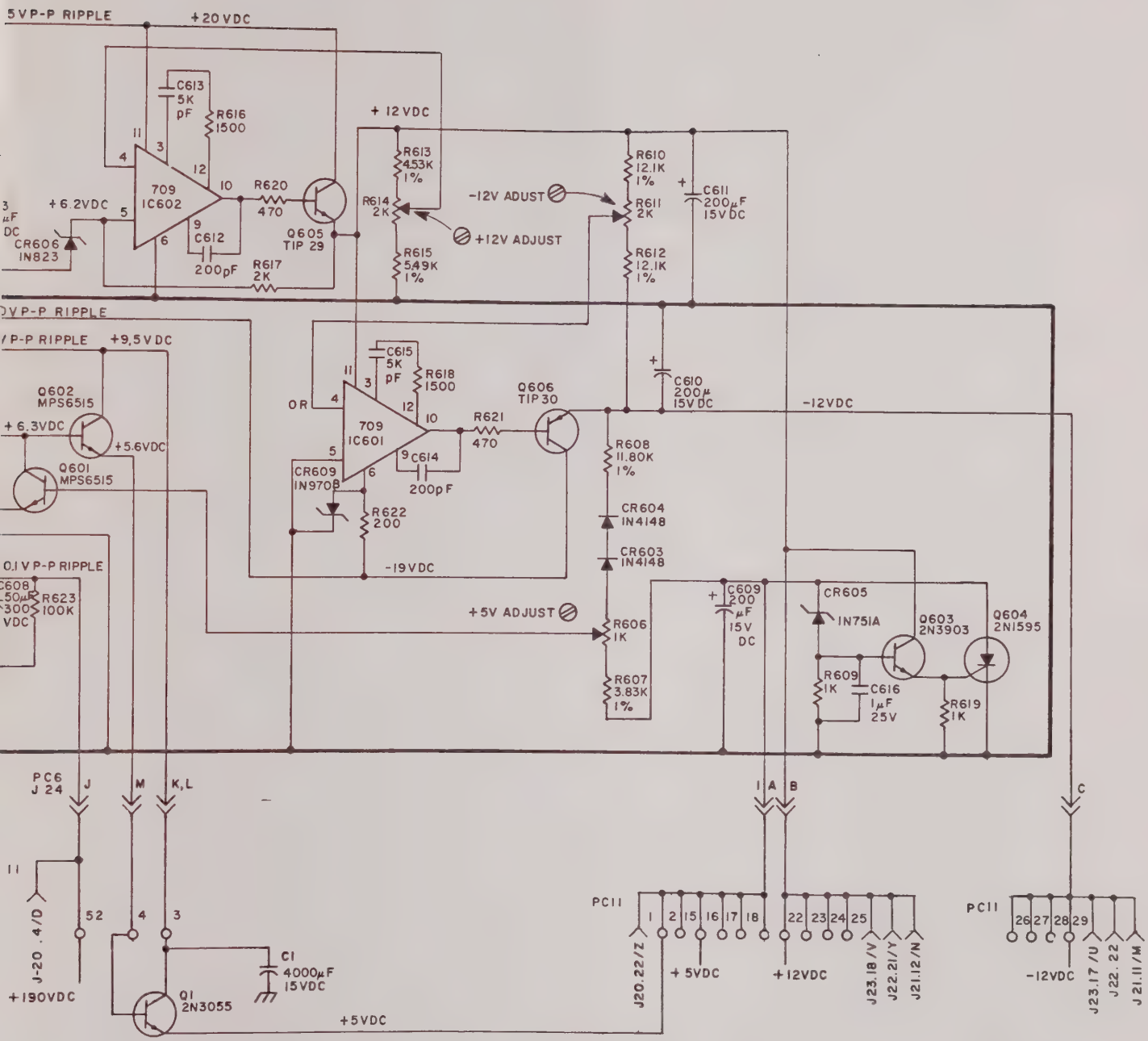
PC 10



B02417-00

Figure 7—10. Reset And Inhibit Logic (E95498) Schematic Diagram

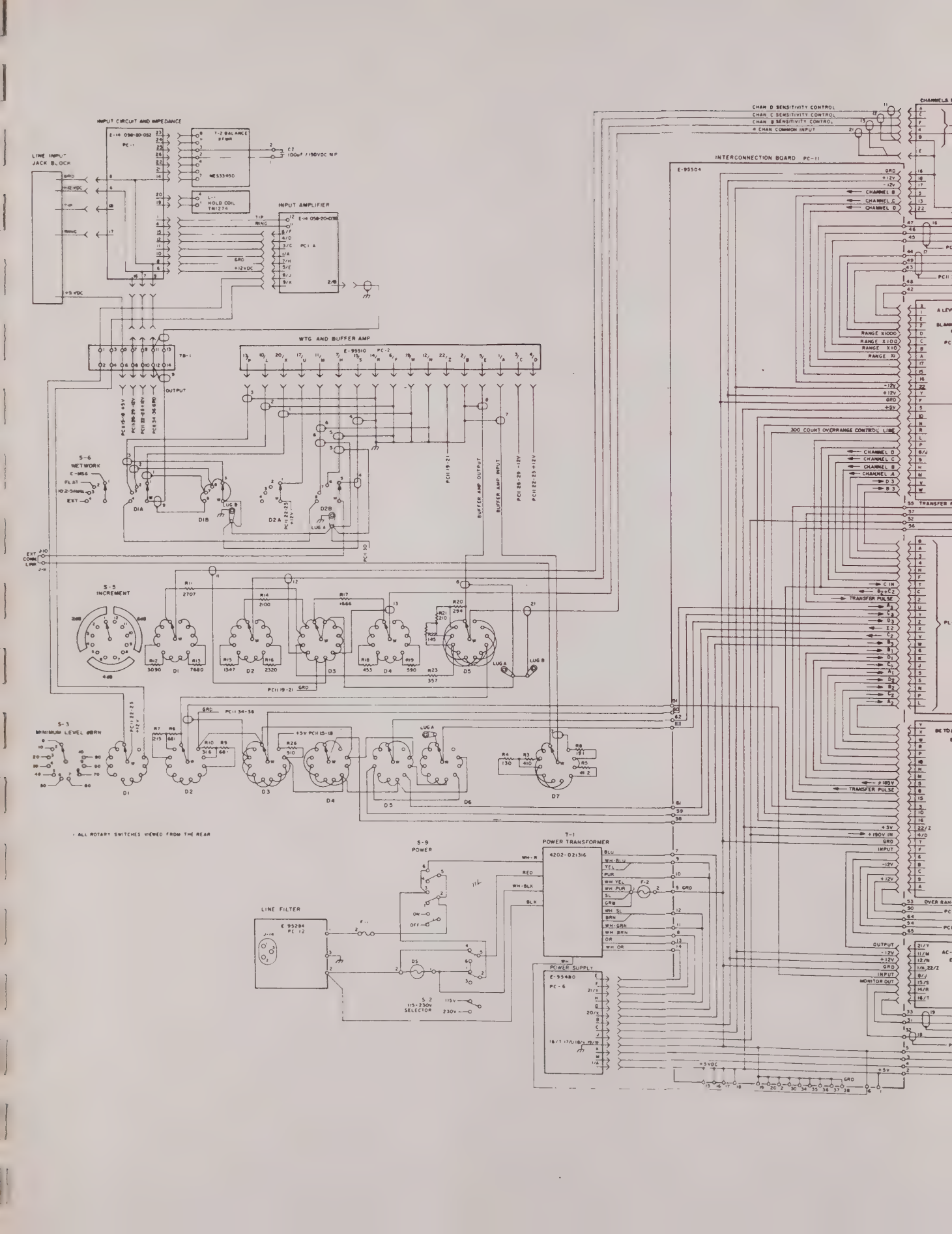

PC11
PC6
18VAC
7
J24
20
OFF
ON
4
6
1
3
WH-R
S-9
5
2
T-1
BLU
9VAC
0.25A
WH-BLU
9
YEL
9VAC
0.25A
WH-YEL
10
PUR
9VAC
0.5A
WH-PUR
SLATE
9VAC
0.5A
WH-SL
GRN
9VAC
0.25A
WH-GRN
12
11
BRN
9VAC
0.25A
WH-BRN
OR
150VAC
0.03A
WH-OR
13
14
18VAC
8
1
2
5
6
F2 3A
NSS3058A
CR607
R601
15
C602
250μF
50VDC
C604
250
50VDC
C605
250
50VDC
R602
30 1W
21
Y
16
T,
17, 18, 19
U, V, W,
4
D
CR601
IR5A1
7
H
CR602
IR5A1
R603
620
R604
620
C606
100μF
15V DC
6
F
5
E
R605
700
C607
50μF
300V
DC
NSS 3064
CR608
S-2
115V
AC
230V
AC
F1
0.3A
SLO-BLO
PC12
L1201
100μH
C1201
470pF
C1202
470pF
L1202
100μH
115/230VAC
50Hz/400Hz
J14
BLK
BLACK
DS-1
WH-
BLK
R



ALL VOLTAGES INDICATED ARE WITH 117VAC LINE VOLTAGE

B02418 00

Figure 7—11. Power Supply (E95480) Schematic Diagram


INPUT CIRCUIT AND IMPEDANCE
LINE INPUT JACK BLOCK
INPUT AMPLIFIER
WTG AND BUFFER AMP
INTERCONNECTION BOARD PC-11
CHAN D SENSITIVITY CONTROL
CHAN C SENSITIVITY CONTROL
CHAN B SENSITIVITY CONTROL
A CHAN COMMON INPUT
300 COUNT OVERRANGE CONTROL LINE
S-6 NETWORK
S-5 INCREMENT
S-3
S-9 POWER
T-1 POWER TRANSFORMER
LINE FILTER
POWER SUPPLY
* ALL ROTARY SWITCHES VIEWED FROM THE REAR

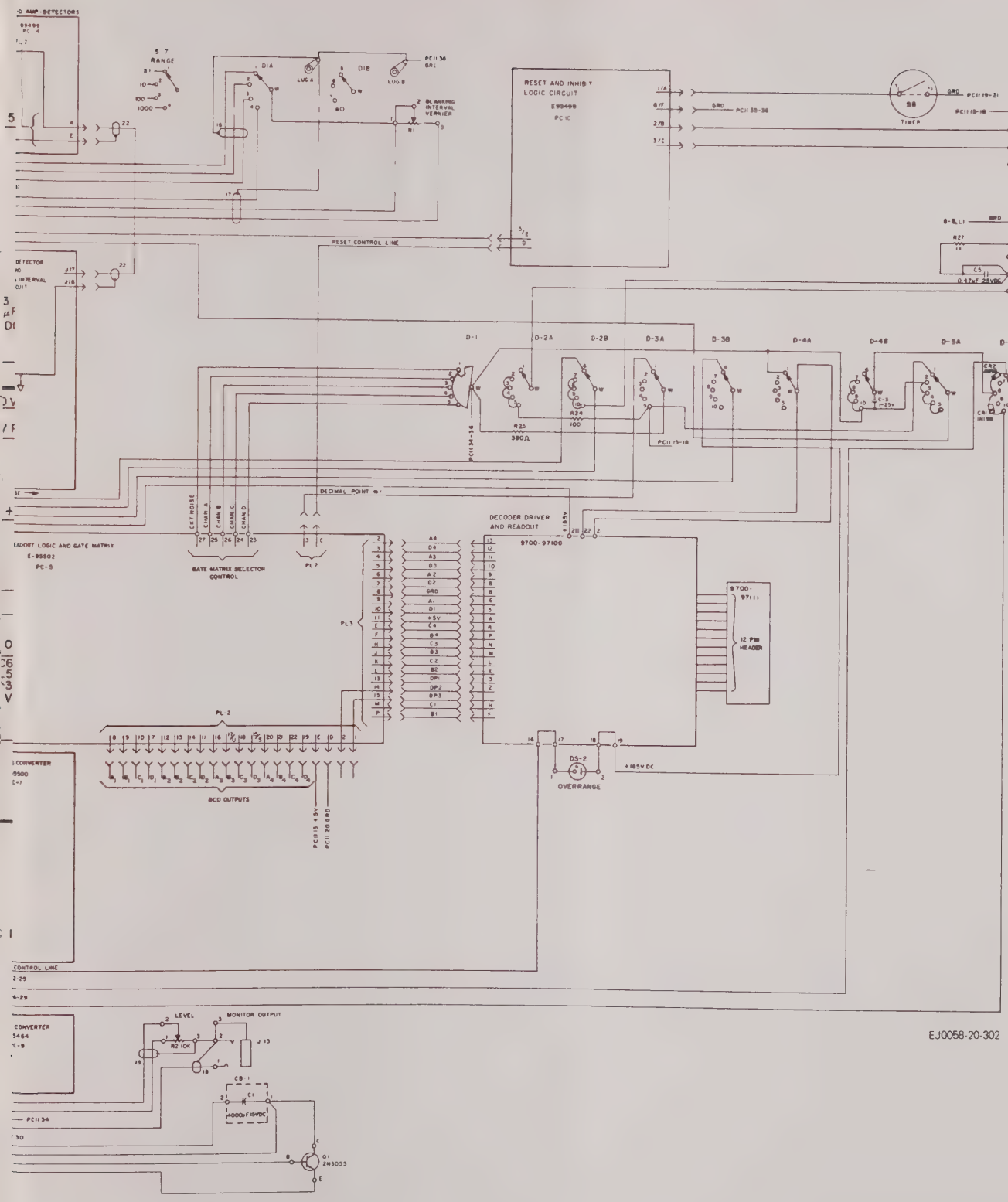
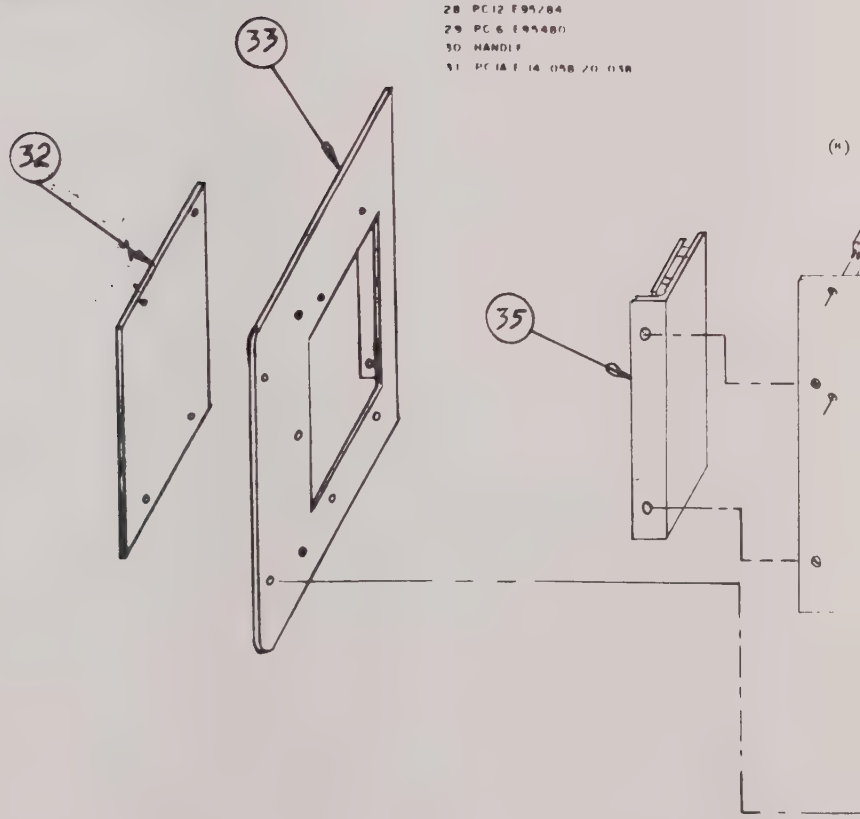
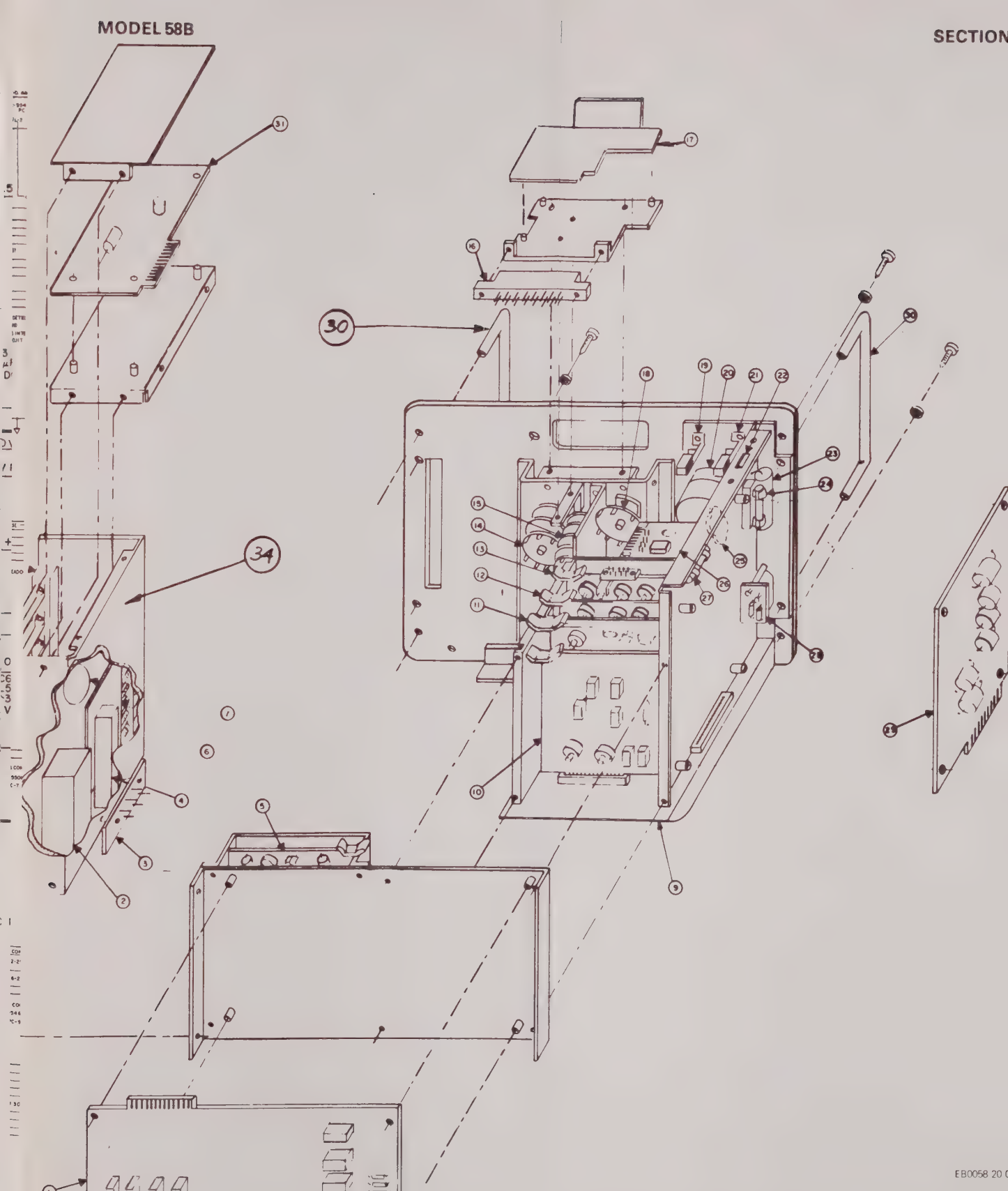


Figure 7—12. Model 58B Interconnection Diagram

32. COVER PLATE
33. MOUNTING PLATE
34. INPUT MODULE
35. NOTCH FILTER ASSY

1 PC 5 E95502
2 T2
3 TB1
4 HOLD COIL
5 PC 2 E95510
6 PC 1 E-14-058-20-032
7 C 2
8 JACK BLOCK
9 PC 11 E95504
10 PC 7 E95500
11 PC 9 E95484
12 PC 3 E95501
13 PC 4 E95499
14 S 4
15 S 5
16 J 28
17 PC 8 9700-97108
18 S 7
19 S 10
20 S 8
21 S 11
22 S 12
23 C 1
24 F 2
25 Q 1
26 PC 10 E95498
27 F 1
28 PC 12 E95484
29 PC 6 E95480
30 HANDLE
31 PC 14 E-14-058-20-038





EB0058 20 0

Figure 7—13. Model 58B-CN Parts Location Diagra

ADDENDUM 1
January 1981
TTS 58B Impulse Counter And Noise Measuring Set
A0058-20-600 ISSUE 3

A1.1 This Addendum documents Model 58B-E Impulse Counter And Noise Measuring Set. A CCITT Psophometric filter has been substituted for the C-message filter.

A1.2 The operation of the Model 58B-E is similar to the operation of the TTS 58B except tha PSOPH should be substituted for C-MSG. Figure A1—1 shows the front Panel of the Model 58B-E.

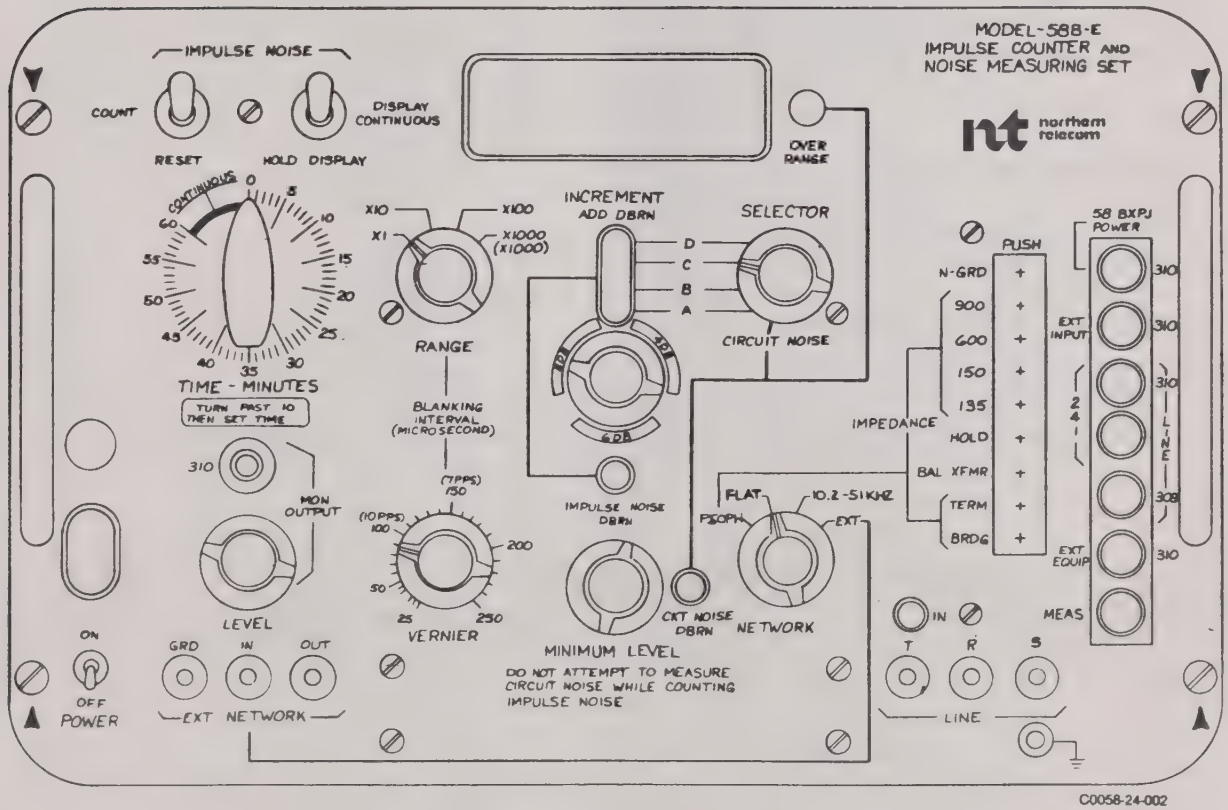


Figure A1—1. Model 58B-E Front Panel

A1.3 Table A1—1 contains the psophometric filter typical response relative to a 0 dB reference at 800 Hz.

Table A1—1. Psophometric Filter Response

FREQ (HZ)	RESPONSE (Relative to 800 Hz)
50	−63±2
100	−41±2
200	−21±2
<300	−10.6±2
400	−6.3±1
500	−3.6±1
700	−0.9±1
800	(Reference) 0.0
900	+0.6±1
1000	+1.0±1
1200	0.0±1
1400	−0.9±1
1600	−1.7±1
1800	−2.4±1
2000	−3.0±1
2250	−3.6±1
2500	−4.0±1
2750	−4.9±1
>3000	−5.6±2
>3500	−8.5±3
4000	−15±3
4500	−25±3
5000	−36±3

A1.4 The filter is composed of second order building blocks using unity gain amplifiers. The unity gain amplifiers are emitter follower circuits. The filter has an amplifier stage to control the 800-Hz loss. Potentiometer R5 (see Figures A1—8 and A1—9) provides an adjustment control.

A1.5 For an input to the filter of 0 dBm (90 dBrn) at 800-Hz, adjust R5 for an output level of 0 dBm (90 dBrn).

A1.6 The following figures and tables provide reference data for the Model 58B-E.

Figure A1—2. Model 58B-E Exploded View
Figure A1—3. Input Circuit And Line Section Assembly And Wiring Diagram
Figure A1—4. Input Circuit Module Assembly And Wiring, Jack Block Wiring Diagram
Figure A1—5. Switch S6 Strapping And Wiring Diagram
Figure A1—6. Networks And Buffer Amplifier PC2 Assembly (95510)
Figure A1—7. Networks And Buffer Amplifier PC2 (95510) Schematic Diagram
Figure A1—8. Psophometric Filter (96968) Assembly
Figure A1—9. Psophometric Filter (96968) Schematic Diagram
Table A1—2. Model 58B-E Overall Assembly Parts List
Table A1—3. Networks And Buffer Amplifier (95510) Parts List
Table A1—4. Psophometric Filter (96968) Parts List

1. PC 5 E96602
2. T1
3. TB1
4. MOLD DOM.
5. PC 2 E96640
6. PC 1 E-14-066-20-032
7. C2
8. JACK BLOCK
9. PC 11 E96604
10. PC 7 E96600
11. PC 9 E96464
12. PC 3 E96601
13. PC 4 E96498
14. S4
15. S5
16. J1
17. PC 8 E96496
18. S7
19. S10
20. S6
21. S11
22. S12
23. C1
24. F2
25. D1
26. PC 10 E96498
27. F1
28. PC 12 E96284
29. PC 6 E96480
30. HANDLE
31. PC 1A E-14-066-20-036
32. COVER PLATE
33. MOUNTING PLATE
34. INPUT MODULE
35. PSCPHOMETER FILTER
36. HOLE PLUG

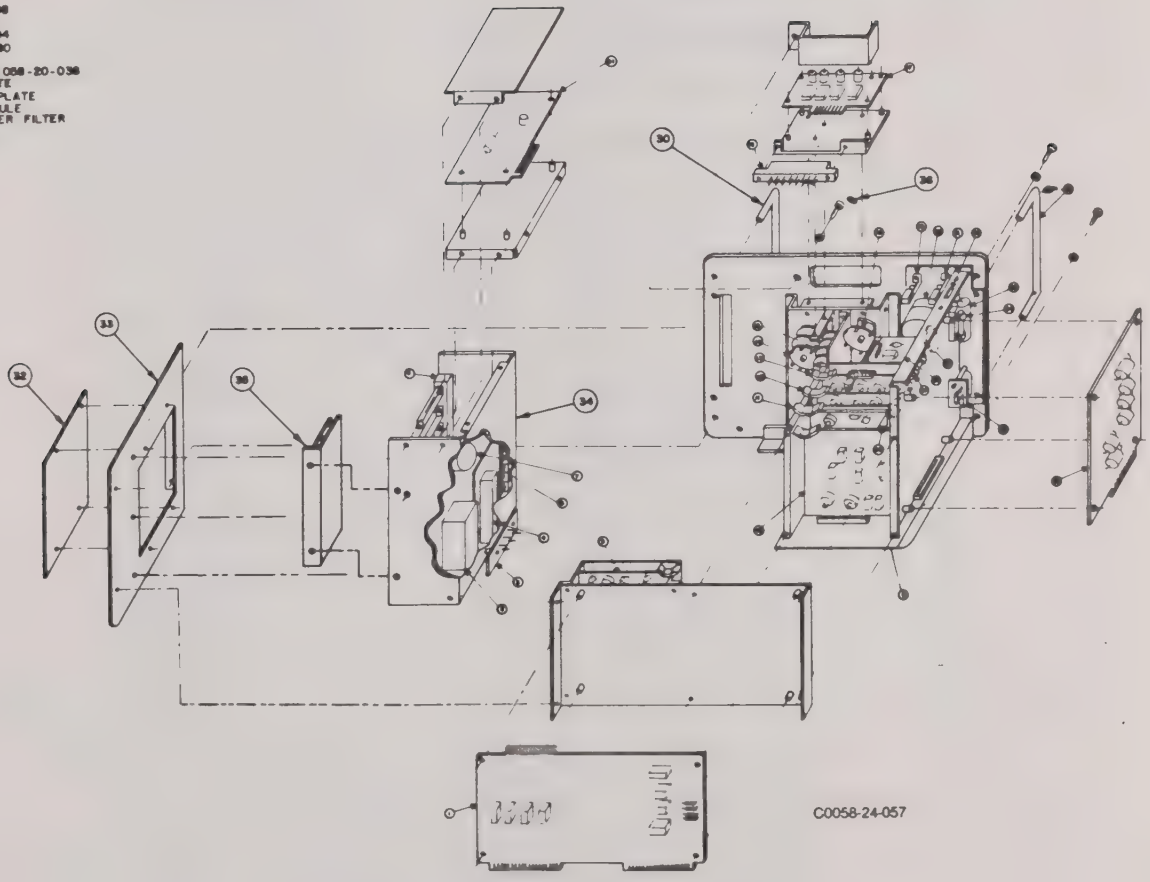


Figure A1—2. Model 58B-E Exploded View

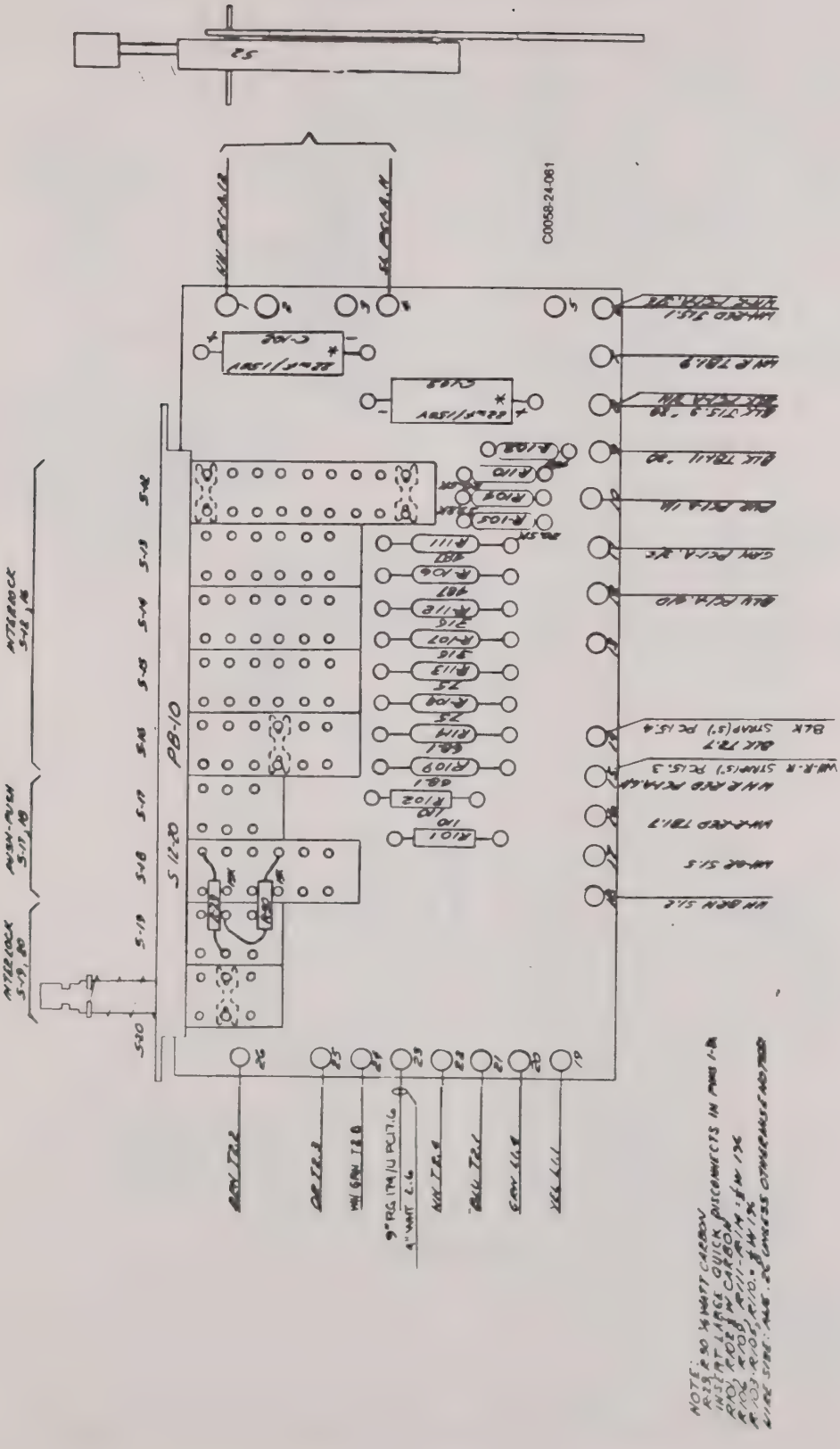


Figure A1—3. Input Circuit And Line Section Assembly And Wiring Diagram

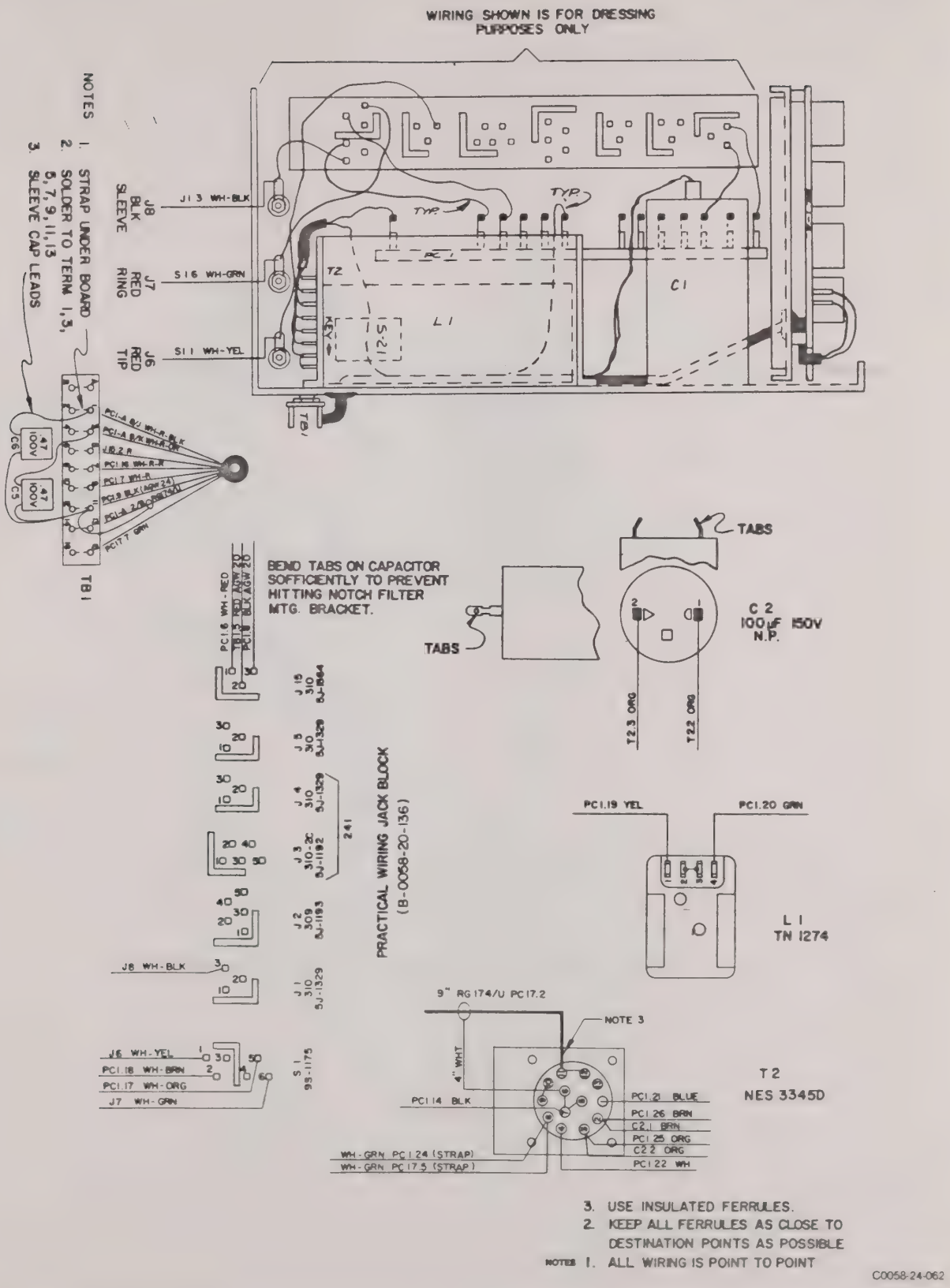


Figure A1–4. Input Circuit Module Assembly And Wiring, Jack Block Wiring Diagram

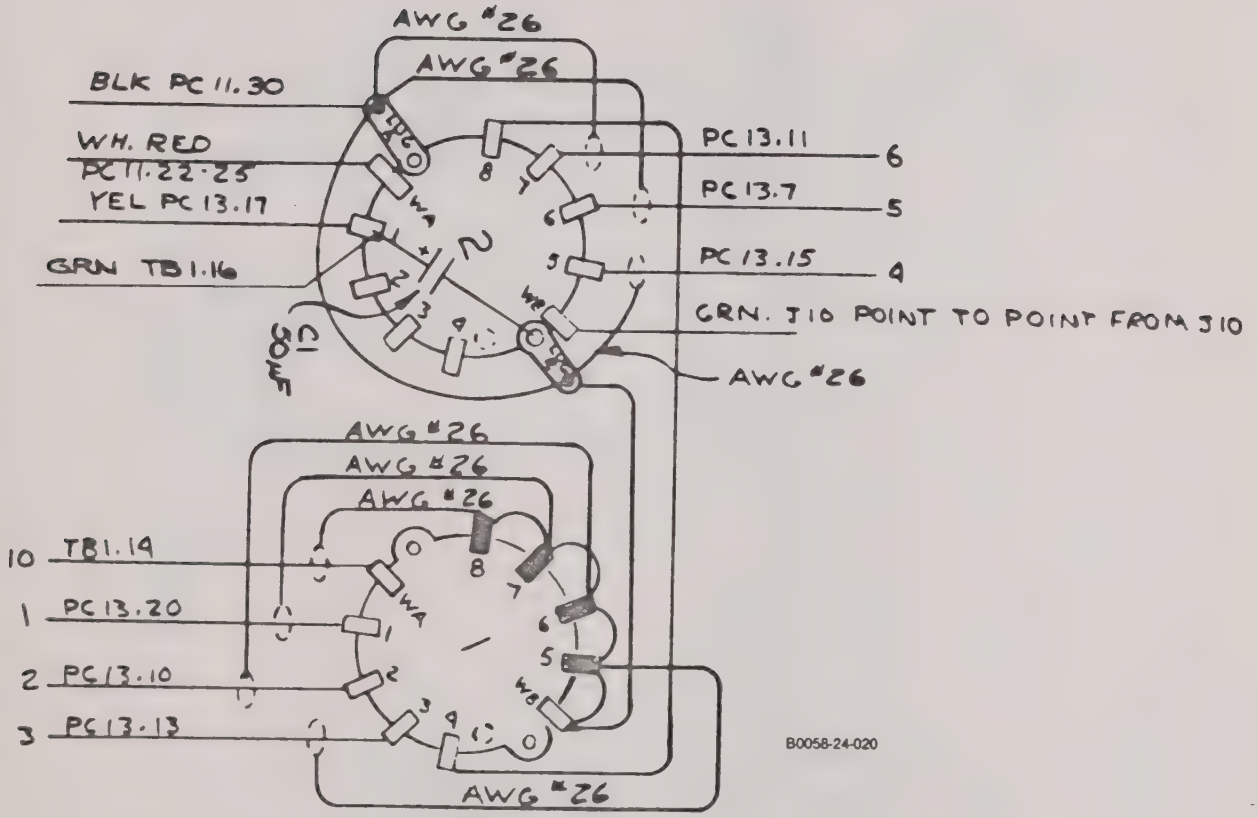


Figure A1—5. Switch S6 Strapping And Wiring Diagram

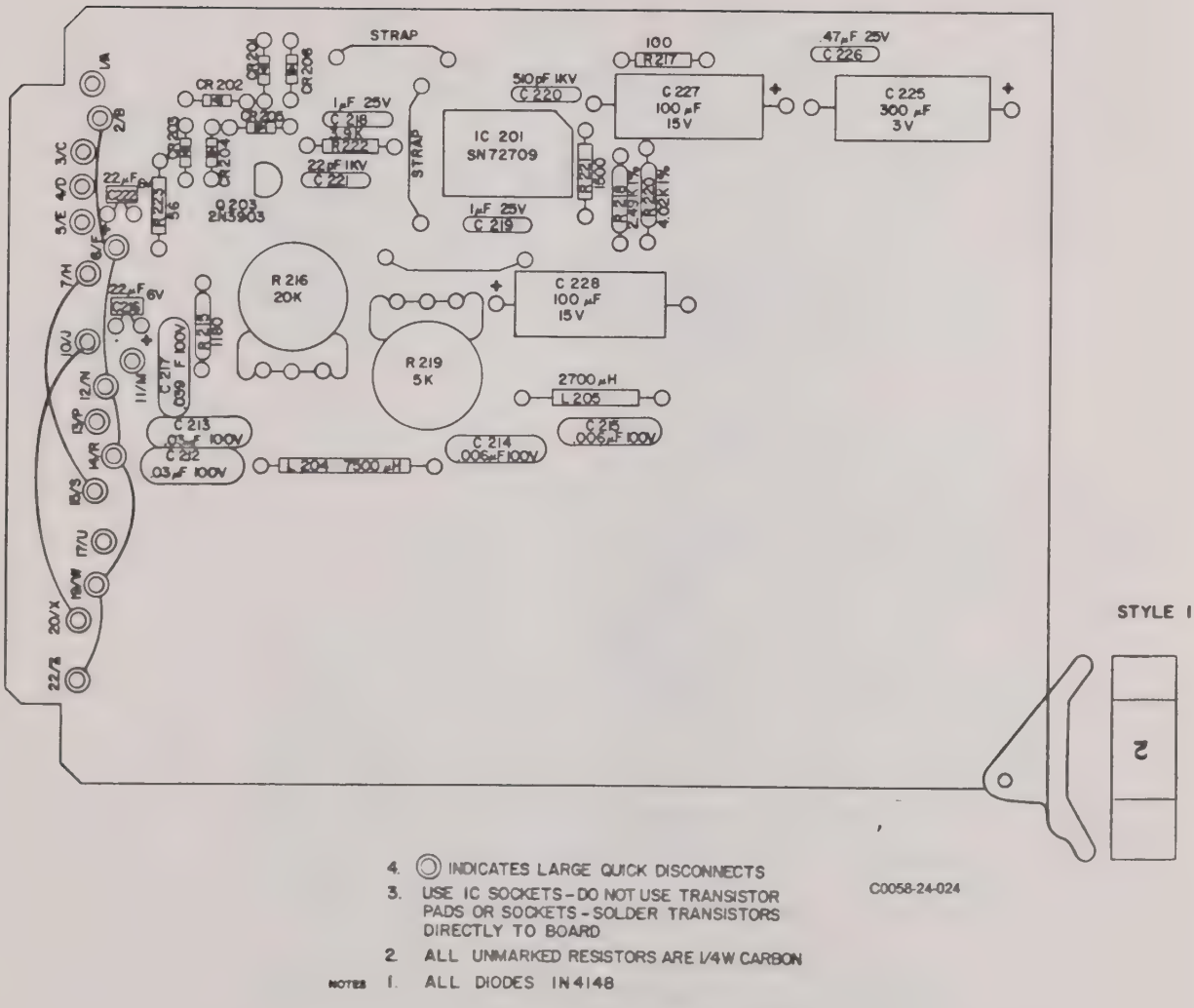


Figure A1–6. Networks And Buffer Amplifier PC2 (95510) Assembly Diagram

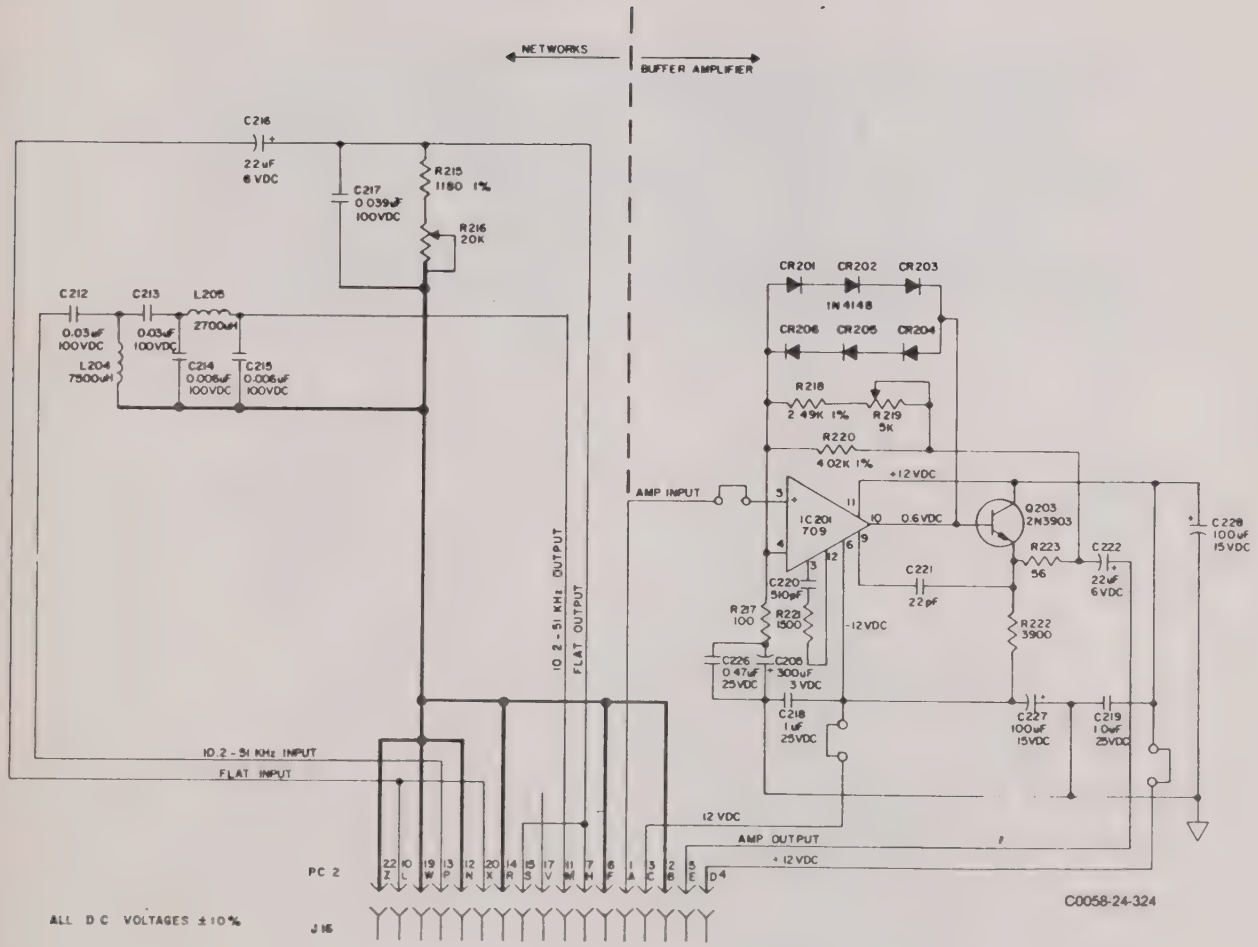


Figure A1—7. Networks And Buffer Amplifier PC2 (95510) Schematic Diagram

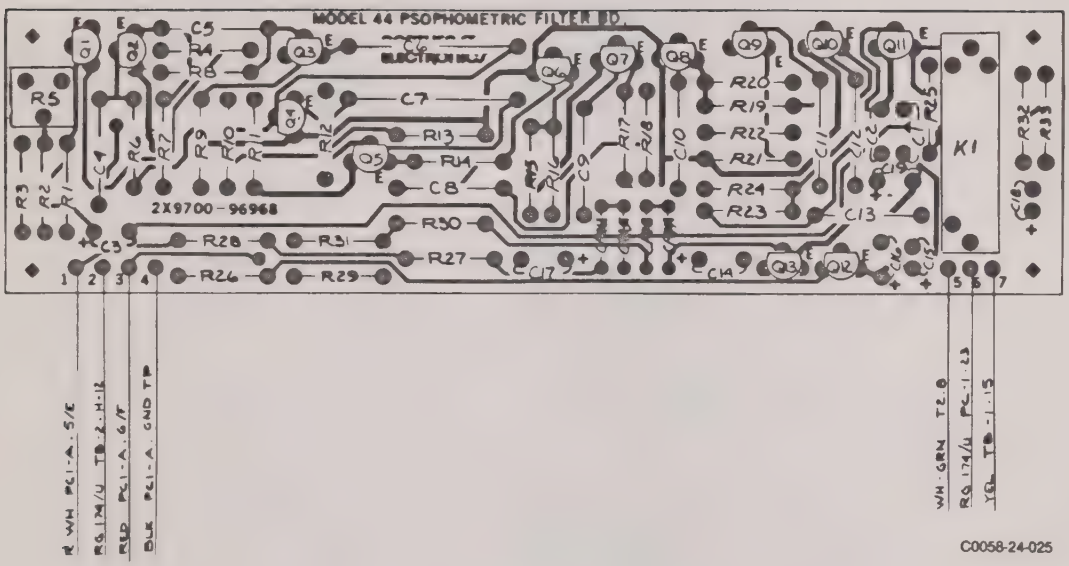


Figure A1—8. Psophometric Filter (96968) Assembly

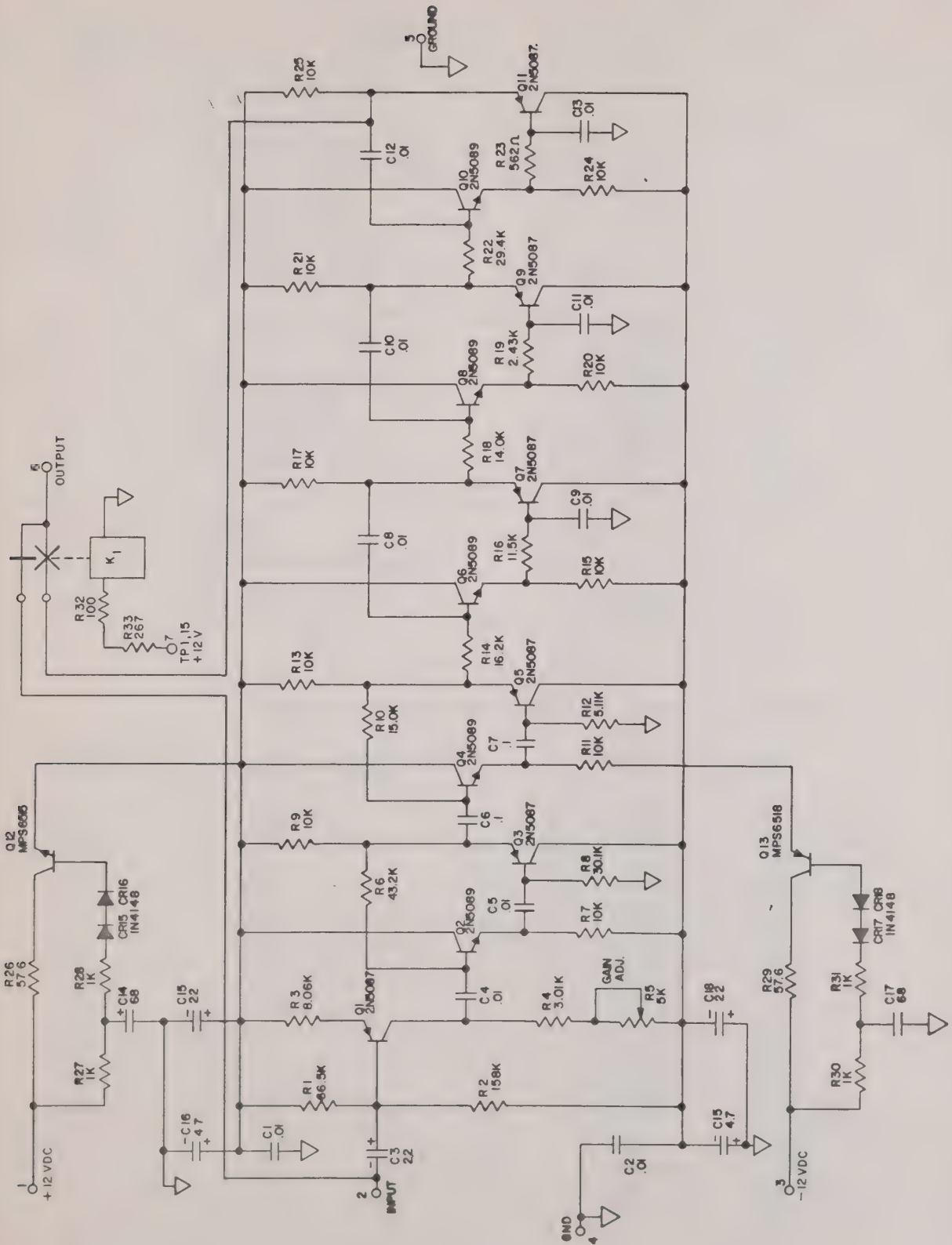


Figure A1-9. Psophometric Filter (96968) Schematic Diagram

Table A1-2. Model 58B-E Overall Assembly Parts List

REFERENCE DESIGNATION	VALUE	DESCRIPTION POWER	TOL	VOLTS	MFGR	MFGR P/N	N.E. P/N
PC2	Buffer AMP 58B-E PC E95510						C005824024
PC3	PC BD ASSY E95501						C005820025
PC4	PC4 CHANNEL B-C-D						C005820026
PC5	PC BRD ASSY E95502						C005820027
PC6	POWER SUPPLY MODULE ASSY						C005820035
PC7	PC BRD ASSY E95500						C005820029
PC8	PC BRD ASSY E95496						B005820030
PC9	PC BRD ASSY E95464						C005820031
PC13	ASSEMBLY PC 13 96056						B005820051
PC14	EXTENDER CARD E95205						A008510027
PC17	PSOPHOMETRIC FILTER						C005824025
C5	.47UFMD	Y5V	20%	100V	ERIE	8131-100-651-474M	330804741
C7	.01UF DF	Z5U GMV		1KV	CENTRALAB	DD-103	330101030
DS2	WHITE LENS				DRAKE	HR118T-603W	82800109
J9	BINDING POST METAL GND				HH SMITH	137P	652500100
J10-11	BINDING POST-RED				GRAYHILL	29-1R	652400400
J12	BINDING POST-BLK				GRAYHILL	29-1B	652400300
J13	JACK,SWCRFT SCHEM 4				SWCRFT	12B	650101000
J25	8-PIN DUAL READOUT				AMP	582140-5	651900500
R1	10K	.5W			CRL	BA401-631	232901030
R2	10K	2W	10%		OHMITE	CU-1031	232002030
R 2 7	1K	¼W	10%		AB	TYPE CB	200101026
S3	S 3 ASSY						B005820017
S4	S 4 ASSY						B005820018
S6	ASSY STRAPPING & WRG 4 POS						B005824020
S7	S 7 ASSY						A005820021
S8	TIMER 60-MIN TTS 58A				RHODES	71002-J	961200100
S10-11		3A	300W	125V	SWCRFT	41203	630600100

Table A1-3. Networks And Buffer Amplifier (95510) Parts List

REFERENCE DESIGNATION	VALUE	DESCRIPTION POWER	TOL	VOLTS	MFGR	MFGR P/N	N.E. P/N
C210	2.2UF		10%	35V	KEMET	T330A225K035AS	310002250
C212-213	.03UF		10%	100V	F-DYNE	PE22-.030-100-10	322103036
C214-215	.006UF		10%	100V	F-DYNE	PE12-.006-100-10	322106026
C216,222	22UF		10%	6V	KEMET	T330A226K006AS	310002260
C217	.039UF		10%	100V	SPRAGUE	225P39391WD3	320003930
C218-219	1UF		20%	50V	SPRAGUE	5C023105X0500C5	330501050
C220	510PFDB	Z5R	10%	1KV	CENTRALAB	DD-511	330005110
C221	22PFDA	N330	10%	1KV	CENTRALAB	DD-220	330002200
C225	300UF			3V	C.DUBILIER	NLW-300-3	300903070
C226	.47UF	Z5UTC	20%	25V	SPRAGUE	5C023474X0500C5	330504740
C227-228	100UF			16V	SPRAGUE	TE-1162	300201071
CR201-206	D0354NS 10MA SI 50UA				FAIRCHILD	1N4148	560041480
IC201	14 DILP				TI	SN72709N	500007090
L204	7.5 MH				DELEVAN	2500-70	450300200
L205	2.7 MH				DELEVAN	2500-48	450300100
Q203	TO-92350MW TA NPN 40V				MOTOROLA	2N3903	550039000
R215	1180-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220211811
R216	20K	.25W			CTS	UPE200RE1-SQ8518	231302030
R217	100-	1/4W	10%		AB	TYPE CB	200101016
R218	2.49K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220224911
R219	5K	.25W			CTS	UPE200RE1-SQ8516	231305020
R220	4020-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220240211
R221	1.5K	1/4W	10%		AB	TYPE CB	200101526
R222	3.9K	1/4W	10%		AB	TYPE CB	200103926
R223	56-	1/4W	10%		AB	TYPE CB	200105606

Table A1—4. Psophometric Filter (96968) Parts List

REFERENCE DESIGNATION	DESCRIPTION VALUE	POWER	TOL	VOLTS	MFGR	MFGR P/N	N.E. P/N
C1-C2	.01UF		20%	16V	CENTRALAB	UK16-103	330701031
C3	2.2UF		10%	35V	KEMET	T330A225K035AS	310002250
C4-5	.01UF		1%	100V	FDYNE	PPA-11-.01-100-1	322401030
C6-7	.1UF		1%	100V	F-DYNE	PPA-11-.1-100-1	322401040
C8-13	.01UF		1%	100V	FDYNE	PPA-11-.01-100-1	322401030
C14	68UF		10%	15V	SPRAGUE	196D686X901 5PE4	310806861
C15	22UF		10%	15V	SPRAGUE	196D226X9015KA1	310802263
C16	4.7UF		10%	25V	KEMET	T330A475K025AS	310004751
C17	68UF		10%	15V	SPRAGUE	196D686X9015PE4	310806861
C18	22UF		10%	15V	SPRAGUE	196D226X9015KA1	310802263
C19	4.7UF		10%	25V	KEMET	T330A475K025AS	310004751
CR15-18	D0354NS 10MA SI 50UA				FAIRCHILD	1N4148	560041480
K1	RELAY, REED, IC, 4 VOLT M.O.				MIDTEX	172-100SD2	604100001
Q1	T0-92350MW TC PNP 50V				MOTOROLA	2N5087	552050870
Q2	T0-92350MW TA NPN 25V				MOTOROLA	2N5089	552050890
Q3	T0-92350MW TC PNP 50V				MOTOROLA	2N5087	552050870
Q4	T0-92350MW TA NPN 25V				MOTOROLA	2N5089	550050890
Q5	T0-92350MW TC PNP 50V				MOTOROLA	2N5087	552050870
Q6	T0-92350MW TA NPN 25V				MOTOROLA	2N5089	550050890
Q7	T0-92350MW TC PNP 50V				MOTOROLA	2N5087	552050870
Q8	T0-92350MW TA NPN 25V				MOTOROLA	2N5089	550050890
Q9	TO-92350MW TC PNP 50V				MOTOROLA	2N5087	552050870
Q10	T0-9235MW TA NPN 25V				MOTOROLA	2N5089	550050890
Q11	T0-9235MW TC PNP 50V				MOTOROLA	2N5087	552050870
Q12	T0-92350MW TA NPN 25V				MOTOROLA	MPS6515	550065150
Q13	T0-92350MW TA PNP 40V				MOTOROLA	MPS6518	550065180
R1	66.5K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220266521
R2	158K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220215831
R3	8.06K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220280611
R4	3010-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220230111
R5	5K	1/2W	10%	200V	HELIPOT	72PMR5K	232705023
R6	43.2K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220243221
R7	10K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210021
R8	30.1K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220230121
R9	10K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210021
R10	15K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220215021
R11	10K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210021
R12	5110-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220251111
R13	10K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210021
R14	16.2K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220216221
R15	10K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210021
R16	11.5K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220211521
R17	10K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210021
R18	14K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220214021
R19	2430-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220224311
R20	10K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210021
R21	10K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210021
R22	29.4K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220229421
R23	562-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220256201
R24-25	10K	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210021
R26	57.6-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220257691
R27,28	1000-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210011
R29	57.6-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220257691
R30,31	1000-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210011
R32	100-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220210101
R33	267-	1/8W	1%		ELECTRA	RN55 SIZE 100 PPM	220226701